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**WHY GOOD CIOs  
MAKE BAD DECISIONS**

A Q&A with MIT's Dan Ariely  
Page 82

**WHERE ASPs CAN  
WORK FOR YOU**

(Hint: Think CRM)  
Page 88

**CONSIDERING A  
PUBLIC-SECTOR JOB?  
CONSIDER THIS....**

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# PORTFOLIO MANAGEMENT HOW TO DO IT RIGHT

Advice from PM Masters  
Plus Tools, Techniques  
and Models Page 56

"You can't complete projects just because you started them," says CKE Restaurants CIO Jeff Chasney. With good PM, Chasney knows which to finish and which to kill.

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VOL. 16 • NO. 14 • MAY 1, 2003

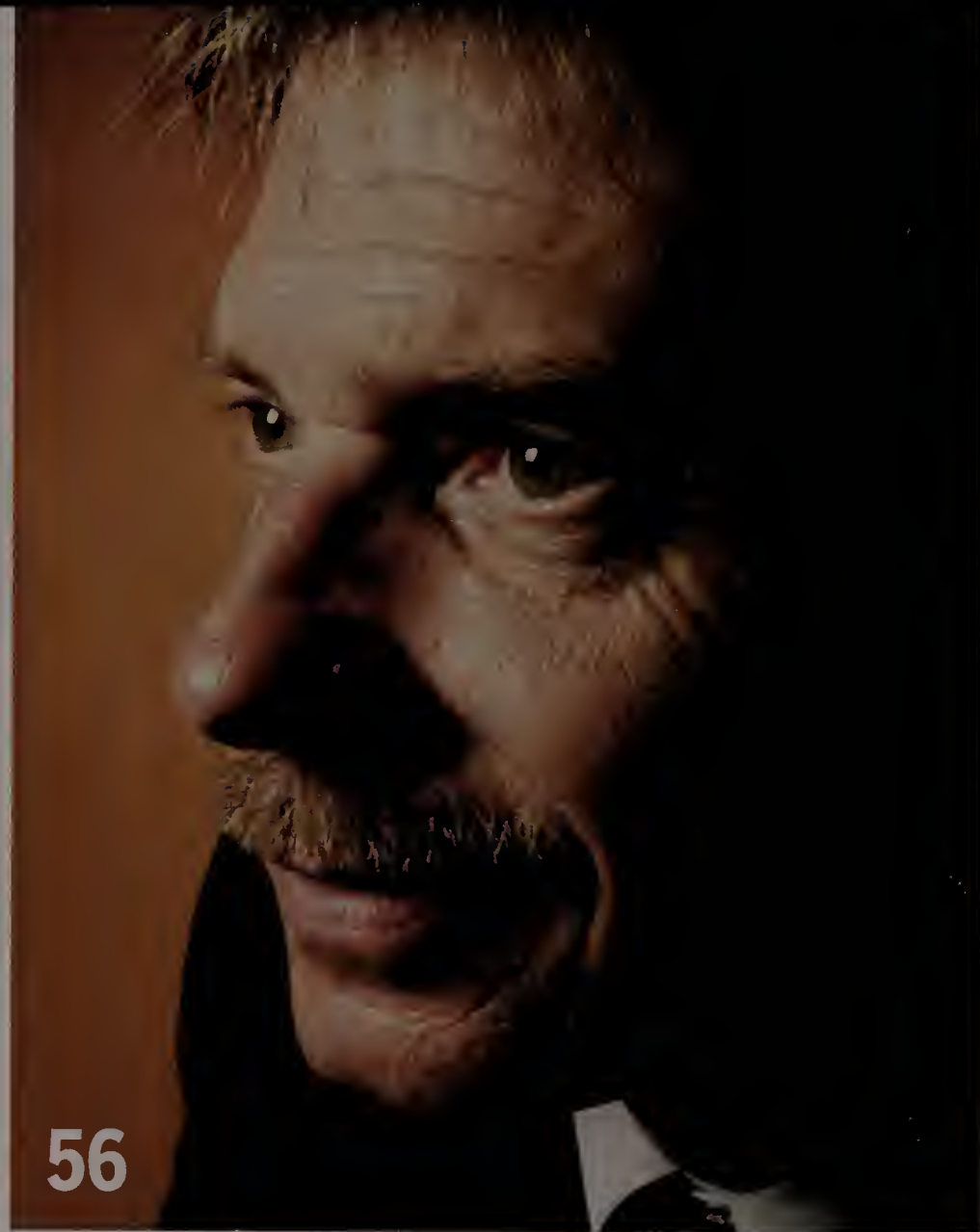
## Cover Story

PORTFOLIO MANAGEMENT | 56

# PORTFOLIO MANAGEMENT: How to Do It Right

Portfolio management is a tool with clear benefits, among them a holistic view of IT projects across the enterprise and the alignment of IT with corporate strategy. But it isn't easy. We've found some portfolio managers willing to share their secrets.  
*By Todd Datz*

COVER PHOTO BY JAY BLAKESBURG



**Jeff Chasney, CIO of CKE Restaurants, reviews IT projects monthly and will cancel a new project if there's a change in CKE's strategy. "You can't complete projects just because you started them," he says.**

## Features

### I.T. STAFFING Staff Alert | 72

With outsourcing on the rise, CIOs are at the center of a morale crisis. They see many of their workers battling stress on the job. The best leaders learn to help employees now—and keep them in the future. *By Stephanie Overby*



British Airways General Manager for E-Service **Dave Bevan** says integrating a hosted sales-force tool was no more difficult than integrating a licensed software package. For more on the increasing number of companies rediscovering ASPs, see "ASPs: The Next Chapter."

### Q&A | DAN ARIELY

#### Why Good CIOs Make Bad Decisions | 82

Dan Ariely's research in behavioral economics seeks to explain why CIOs make poor investment decisions and why they don't know what technology is worth. *By Meridith Levinson*

### SALES AND MARKETING AUTOMATION ASPs: The Next Chapter | 88

Application service providers are increasingly viewed as a viable option in the CRM space, particularly for small and midsize companies. *By Meridith Levinson*

### CIO ROLE

#### From Private to Public | 94

Private-sector CIOs are bringing new levels of expertise to government IT. And public service teaches CIOs skills that the private sector is finding ever more essential. *By Tracy Mayor*

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### NET GAINS

#### How to Keep Your Customers Satisfied | 44

To learn if end users are happy, you have to ask the right people—and the right questions. *By Mohanbir Sawhney*

### PEER TO PEER

#### How to Pass the Stress Test | 50

An IT executive tells the story of his own stress-related breakdown and recovery, and reveals what you can do to avoid the abyss.

*By John L. Haugom*

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**PROFILE:** The CIO's CFO—Rick Puckett.

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Manage IT as a portfolio.

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### Walk the Expectation Tightrope

CIOs need a light touch to set business managers' expectations on IT projects—and still appear helpful.

*By Meridith Levinson*

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How to lead as a team of CXOs.

### Leadership Agenda | 106

Full-circle or 360-degree feedback assessments must meet three conditions to be useful. *By Susan H. Cramm*



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"Business managers have got to know you want the project to work just as badly as they want it to or more so," says Hon Industries CIO **Malcolm Fields**.

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Categorization software helps search-tool users find what they seek.

*By Fred Hapgood*

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### COMPANY TO WATCH | 113

Polycom eliminates connection boundaries to distance conferencing.

## In Every Issue

### FROM THE EDITOR

#### The Case for Portfolio Management | 20

If CIOs would just look at the business case for portfolio management, maybe more of them would do it.

*By Richard Pastore*

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Abstracts of all the feature stories found in this issue.



**"CIOs shouldn't forget that business units aren't captive customers whose loyalty can be taken for granted. CIOs who can't satisfy users may find their jobs on the line."**

—Mohanbir Sawhney, Net Gains columnist, on user satisfaction Page 44





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## WEB >connections

Interactive features from May 1 to May 15

### ADD A COMMENT

## Asking the Right Questions

Net Gains columnist Mohanbir Sawhney says if you aren't careful, customer satisfaction measurement may be doing your IT organization more harm than good (see **How to Keep Your Customers Satisfied**, Page 44). You need to know who to ask—and what to ask them. What do you think? Are your customers loyal because they have no choice? Ask Professor Sawhney your questions or give him your two cents. Go directly to the online column from the CIO.com homepage.

### WEIGH IN

## How do you keep your staff happy?

Be a good buffer. Offer creative outlets. That's just some of the advice for the care and feeding of your precious IT staff in these tight times (see **Staff Alert**, Page 72). What techniques have you used to keep your star performers happy and productive?

Go to [comment.cio.com/weighin](http://comment.cio.com/weighin).

You can also find the links to these pieces in the **WEB CONNECTIONS** box at [www.cio.com](http://www.cio.com).

## The Best Practice Exchange

In **Portfolio Management: How to Do It Right** (see Page 56), experts offer advice for prioritizing IT investments and aligning them with corporate goals. What's your take on portfolio management? Has the payoff been worth the effort? How do your colleagues' experiences compare with your own?

From May 1 to 15, the CIO Best Practice Exchange, CIO's members-only online forum for IT executives, will focus on **IT portfolio management**. To join them, visit [exchange.cio.com](http://exchange.cio.com). (For qualified IT executives only. New members must apply.)

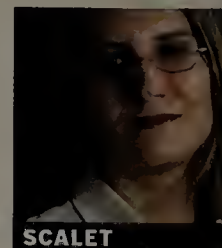


## Our Daily Web

**MONDAY Tech Tact** Technology Editor Christopher Lindquist covers what's coming.

### TUESDAY

**Alarmed** Security experts Sarah D. Scalet and Scott Berinato give you something new to worry about.



SCALET

### WEDNESDAY

**Metrics** Web Writer Jon Surmacz makes sense of the numbers.



BERINATO

### THURSDAY Sound

**Off** Web Editorial Director Art Jahnke opines on managerial, political and ethical dilemmas.



SURMACZ

**FRIDAY The Big Picture** Charts and graphs that are worth a thousand words.

## What's In Store

Several CIO Focus guides are on sale now in the CIO Store that relate to stories in this issue:

- **Staff Alert** (see Page 72): How to Retain IT Staff in Boom Times and Bad
- **ASPs: The Next Chapter** (see Page 88): Customer Relationship Management: Maximizing Rewards, Minimizing Risks
- **Portfolio Management: How to Do It Right** (see Page 56): Strategic Planning: How to Develop and Align IT Strategy

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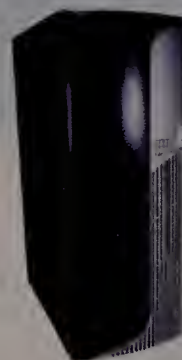
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# From the Editor

*pastore@cio.com*



What do your peers have to say about portfolio management? From May 1 to 15, the CIO Best Practice Exchange, CIO's members-only online forum for IT executives, takes up the case of portfolio management. (New members must apply.) Go to [exchange.cio.com](http://exchange.cio.com).

## The Case for Portfolio Management

**SEVENTY-FIVE PERCENT** of companies do not possess clear, ongoing oversight of their IT project portfolios, according to an AMR Research study. In this economy, where people continue to lose their jobs and capital funding is severely rationed, this lack of oversight seems criminal. Most CIOs continue to steer project funding ad hoc, project by project, with little thought for the entire investment picture. Perhaps they just don't realize how powerful a tool portfolio management is and what a great payoff it provides for such little investment. Using the information in "Portfolio Management: How to Do It Right" (Page 56), I've sketched out a little business plan that I hope will make the case for portfolio management.

### Benefits to the Organization

1. Fairer decisions about funding. Both initial project approval and ongoing management are based on a holistic view of total investments prioritized by relative benefit to the enterprise—not on a project sponsor's political muscle.
2. Optimal mix of investment risk and reward. Portfolio management facilitates the balance of riskier, higher-reward projects versus safer, lower-reward ones because it categorizes, prioritizes and monitors new and ongoing investments.
3. Better communication between IS and business leaders. Portfolio management gives IT and business leaders a common language and platform for

communication because it is a financial model.

4. Greater understanding and cooperation over funding allocation. Everybody sees where the dollars are flowing and why.
5. Greater business accountability for investments. Portfolio management can be used to assign responsibility to appropriate leaders.
6. Strengthened alignment between IS and the business. Portfolio management dictates that technology investments map to corporate strategic objectives. Misaligned projects surface quickly.
7. More efficient use of human resources. The number of IT staff and managers allocated to various projects becomes more visible and comparable.
8. Fewer redundant and overlapping projects. The portfolio view exposes redundancy.

### Costs in Time and Resources

1. The time necessary to take inventory of all ongoing and proposed projects, sort them into categories and populate the portfolio.
2. Cost to develop or purchase a portfolio management tool.

Hopefully this brief business case will wake up a few people at those 75 percent of companies that are missing out on this very powerful tool. But I have my doubts; another study by Meta Group showed that only 16 percent of companies bother with business cases for their IT projects.

It figures.

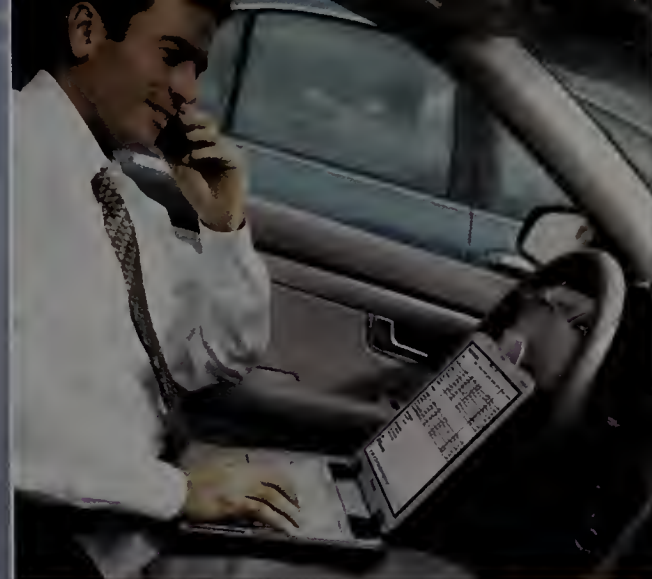
*Richard Pastore*

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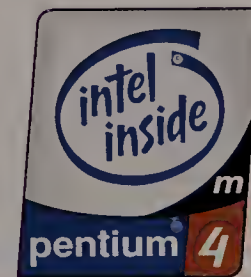


Toughbook 72

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# InBox

Reader Feedback

## CIGNA ARTICLE WAS OFF-BASE

Your March 15 article ["Cigna's Self-Inflicted Wounds"], about Cigna HealthCare's transformation initiative to integrate its customer service relationship management system, missed the mark on a number of levels. Let me address just two: the initiative's results and its management.

While there were significant challenges associated with the company's migration of some of its customers from multiple legacy systems to a new system in January 2002, those issues have been addressed. The result is that currently 5 million Cigna HealthCare members are receiving the benefits of this new system, including quality customer service, faster claims management, quicker call center resolution, and more robust online reporting and transaction tools. Millions more will be receiving the benefits of this system in the future.

Moreover, the article unfairly maligned the role of Cigna's CIO, Andrea Anania. Andrea and the entire systems community have worked closely with Cigna HealthCare to turn around the challenges faced by the business early last year. As a result, our midyear 2002 and January 2003 migrations have gone well, our customer satisfaction scores are up, and our technology is now clearly competitive.

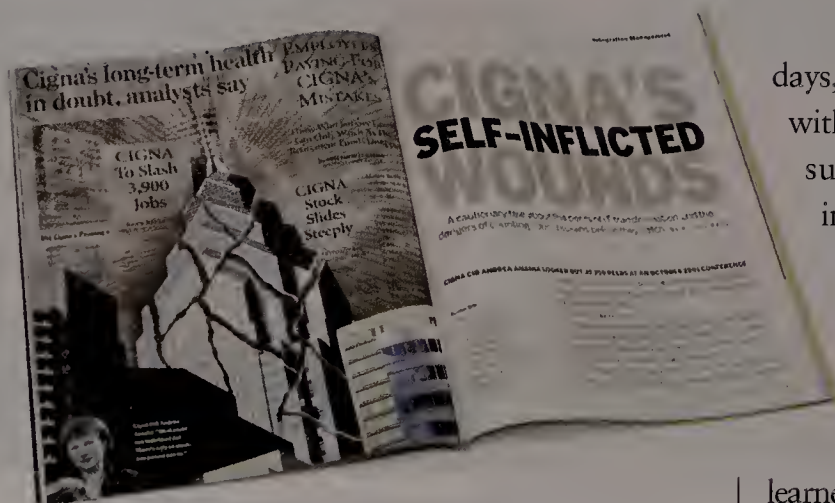
Ed Hanway • *Chairman and CEO • Cigna*

How can we assume that our situation is so unique that we can learn nothing from anyone else? And how can we assume that our managers are creative enough to think up the best solution?

I just don't think this is realistic because if it were, there would be no market for consultants, no research on business, no books written with management advice—and perhaps no point in teaching management.

I have known some managers who felt this way and didn't read anything. I wish they had.

Paul Arveson  
[paul@arveson.com](mailto:paul@arveson.com)



days, projects are completed on time and within budget," is because these days, successful leaders have embraced integrity, honesty and accountability as cornerstones of their management philosophy.

I am sure that the colleagues and consultants Anania fed to the wolves to keep her job learned some hard lessons about integrity, honesty and accountability.

Nick Camino  
[ncamino@sbcglobal.net](mailto:ncamino@sbcglobal.net)

## WHERE'S THE LEADERSHIP?

I just finished reading the article in CIO outlining the failed Cigna systems rollout. CIO Andrea Anania portrays herself as a victim of circumstance, over-taxed and unable to control the project. What I see is a CIO who provides weak leadership, assigns blame to others and hides behind excuses.

When she stood up and declared that she had successfully reengineered her company's IT, did she forget that there is no "I" in team? It is lonely at the top, but it is a lot lonelier when you take all the praise and none of the criticism. The reason Anania can proclaim, "These

## BEWARE OF REINVENTING THE WHEEL

Michael Schrage's column "Worst Practice" [Feb. 15] makes a good point, that we must not blindly copy the best practices of others without considering the impacts on all of our stakeholders. But the article presents us with a dilemma—is he saying that we should ignore all external experience and try to invent everything ourselves? Wouldn't this be, in many cases, reinventing the wheel?

## OPEN SOURCE: MORE COVERAGE NEEDED

Well, it's about time! Thank you for laying out in the March 15 issue ["Your Open-Source Plan"] what many of us have realized for years: That open source is fast becoming a very viable alternative to proprietary operating systems. Having a number of articles discussing tangible real-world benefits will hopefully serve to educate more CIOs, many of whom have unfortunately been persuaded more by marketing than reality.

Bob Fately  
*Vice President, Third Wave*

## WHAT DO YOU THINK?

Send your thoughts and feedback to [letters@cio.com](mailto:letters@cio.com). Letters may be edited for length or clarity. For links to all articles mentioned, go to [www.cio.com/printlinks](http://www.cio.com/printlinks).



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Edited by Lafe Low and Michael Goldberg

TECH LABOR MARKET

## Technology Job-Hunters Unite!

**LOUIS FRISSORE RUNS DATA CENTERS.** Alexander Cedrone, a data warehouse manager, makes CRM work. Susan Bradley is a human resources manager who has honchoed PeopleSoft implementations.

One by one, they and some 30 other tech-savvy pros took their brief turns on stage recently to share their experiences with 200 of their peers. A few years ago, this same crowd might have gathered at a posh downtown hotel to hear presentations about IT project lessons or innovative technologies.

But not today. This meeting is about job-hunting.

This is The 495 Networking Support Group. It assembles weekly at Congregation B'nai Shalom, a synagogue in Westboro, Mass., not far from where Data General engineers once designed advanced minicomputers (inspiring the best-selling 1981 book *The Soul of a New Machine*).

A lot more than the size of computers has changed since then. Data General is gone—now part of storage giant EMC. Route 495, the technology-heavy highway ringing Boston, is dotted with office buildings featuring For Lease signs. The only thing trending up around there is The 495 Networking Support Group's size: It has grown to 1,700 members in two years.

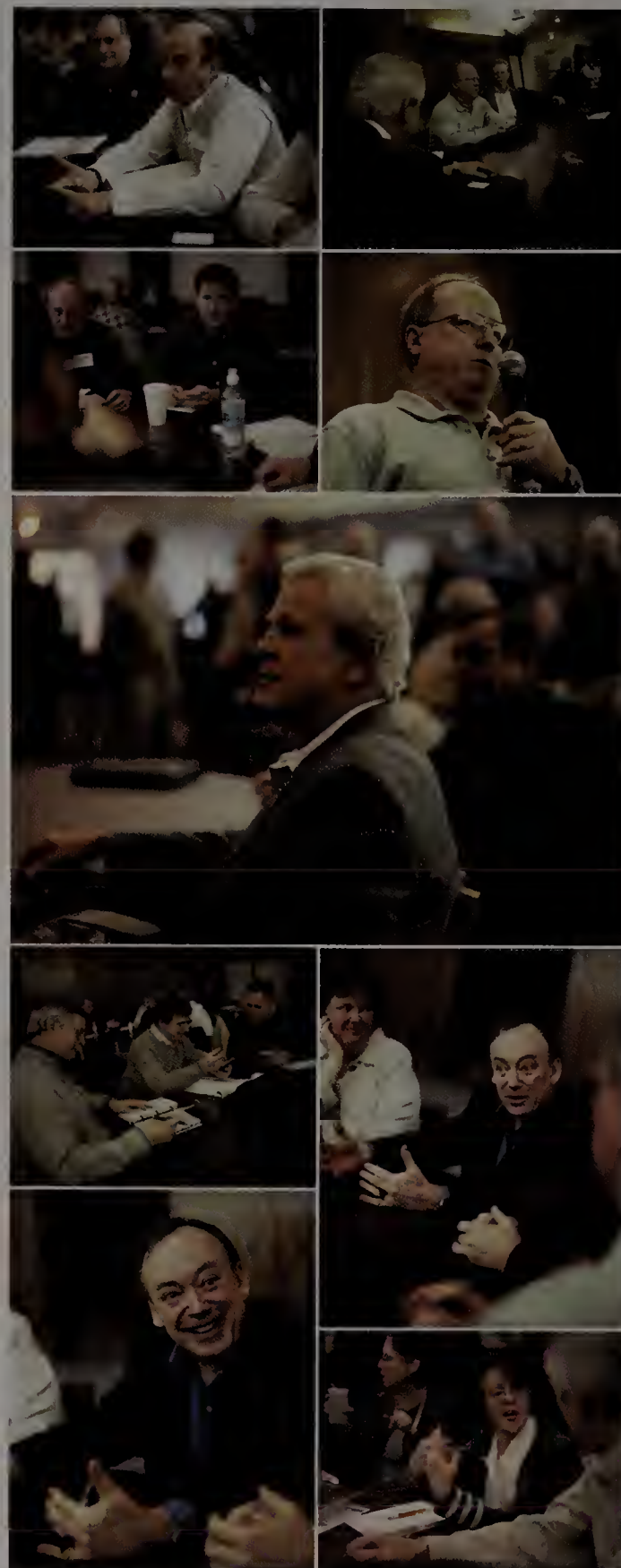
The Labor Department reports that 308,000 jobs were lost in February as the unemployment rate hovered at 5.8 percent. A study by the trade group American Electronics Association showed a combined loss of 560,000 high-tech jobs in 2001 and 2002, mostly in manufacturing and communications services.

The Boston area represents a particularly sour spot for white collar, IT-oriented job-hunters, says Paul Harrington, a labor economist at Northeastern University. Massachusetts has lost 157,000 jobs, or 4.7 percent of its workforce, since the recession started in January 2001. Losses have hit low-end manufacturing and high-end professional services. "What makes this recession unique is that it's more white collar than in the past," Harrington says.

In the synagogue's meeting hall, Tony Badman, 57, cofounder and president of the networking group, explains that 495 is like many of the support organizations that have sprung up around the country in this recession, but with a difference: There's an emphasis on action.

*Continued on Page 30*

The 495 Networking Support Group meets Wednesday mornings to share job-hunting leads in the high-tech industry and in IT. Tony Badman (smiling, at right), president of the group, is a former project manager for EMC and Data General.



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## FEDERAL REGULATIONS

## Don't Call Us

**THERE'S NOTHING MORE ANNOYING** than a stranger calling during dinner to sell you long-distance service or pitch a new credit card. The Telemarketing and Consumer Fraud and Abuse Prevention Act, which Congress passed in 1994, prohibits telemarketers from calling consumers who have specifically requested to be left alone. The Federal Trade Commission is taking that a step further by creating a national "Do Not Call" registry, which it expects to have operational by October. Legislators recently allotted \$16 million for the program. Consumers will be able to add their names to the list for free. Telemarketing companies then have to purchase the registry, and those companies that violate it are subject to fines of up to \$11,000 per incident.

More than 25 states have similar "Do Not Call" registries, but those only protect consumers from local companies calling from within the state. Ed Picard, Northeast area director for GovConnect, has helped develop registries for Kansas, Wisconsin and most recently Massachusetts. GovConnect is currently bidding for the national registry.

The Massachusetts "Do Not Call" registry launched on Jan. 1, 2003, and already contains more than 934,000 phone numbers. Consumers can register online and telemarketers can go online to download the registry list. The list is updated quarterly and costs telemarketers \$1,100 per year, Picard says. Don't get too used to a quiet dinnertime, though. In Massachusetts, politicians and nonprofit groups such as universities and charities are not required to purchase the "Do Not Call" registry.

—Julie Hanson



## Technology Job-Hunters

Continued from Page 28

So besides the usual networking sessions, 495 has a password-protected website that posts résumés and job opportunities. The group presented a survey about members' economic struggles to state and federal officials to lobby for more government support. Members give brochures about the group to area employers through their employed spouses. They're even talking about opening up an office to offer the group's programming and IT expertise for contract hire.

The reality, however, is that no matter your experience or the effort you put into looking for work, jobs are hard to find. As she hunts, Bradley, the HR manager, teaches an organizational behavior course at the online University of Phoenix. Badman, who delivers the U.S. mail two days a week, says that many in the group realize they may have to settle for jobs that are less prestigious and remunerative than they had in the boom years.

That certainly goes for Frissore, 54, a 30-year IT veteran who worked as a data center manager for EDS until July 2002. Now he's a part-time photographer, taking team photos for youth leagues. The support group helps, says Frissore, because "everyone here is in the same boat." His outlook? "The chances of me finding a decent job in IT are slim. I'll probably have to settle for a job in another field for a lot less money."

—Michael Goldberg

## SECURITY SPENDING

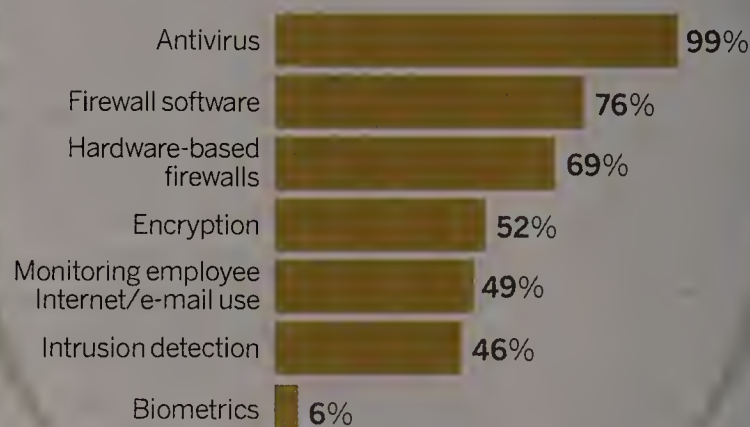
## Where Have All the Euros Gone?

**SECURITY IS A** primary concern everywhere, but in Europe that concern isn't reflected in budgeting decisions. Security ranked third on the list of anticipated IT budget increases for European companies, according to a recent report from IDC (a sister company to CIO's publisher). IDC analyst Carla Arend says this imbalance indicates that European companies are still struggling with (and spending on) the immediate needs of making their systems work and integrating data across different systems. Once those basic issues are resolved, spending on security solutions is likely to rise. The survey projects that companies in France, Germany and Italy will raise their security spending the most in 2003.

—Kathleen Carr

## Security Adoption in Europe

Here's how European companies are spending their security euros. (Percentages indicate the amount of companies that have invested in that particular technology.)



SOURCE: "BUILDING SECURE ENVIRONMENTS—EUROPEAN CORPORATE INFRASTRUCTURE SURVEY," 2002, IDC



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# On the Move

By Meredith Levinson

## Destination Anywhere



**ALEX ZOGLIN** (left) has hit the road. Last month he left his post as CTO of Orbitz after a three-year tenure with the online travel agent. He is credited with using proprietary, low-cost technology to design the online booking platform that connects Orbitz.com directly to the airlines' internal host systems. Orbitz had not named a successor at press time, but it had retained executive search firm Blackbird Partners to find a replacement. Zoghlin didn't say where his travels were taking him.

Too bad Orbitz can't recruit **Stuart Walters** to succeed Zoghlin. Walters' experience in the travel and e-commerce business would make him a suitable match. Walters was hired in January as the new CIO of Opodo, the Pan-European online travel portal launched by nine European airlines (Aer Lingus, Air France, Alitalia, Austrian Airlines, British Airways, Finnair, Iberia, KLM and Lufthansa). Prior to working for Opodo, Walters consulted for online travel agencies while he was employed by IT services company Nascence. Before that, he was COO of U.K.-based online travel agent Dreamticket.com and IT director for Airtours UK Leisure Group.

In other news from the travel industry, America West promoted its CIO, **Joseph Beery**, to senior vice president and CIO. Beery's promotion comes amid an executive reorganization at the airline that includes the promotions of two other corporate officers and the resignation of the company's executive vice president. On the other side of the globe, Air New Zealand named **Robert Fyfe** as its new CIO. Fyfe most recently served as COO and managing director of ITV Digital.

### CIOs in HR?

More companies are adding HR responsibilities to their CIOs' already full plates. Last March, **Kenneth M. Smith** started juggling his CIO responsibilities with his new function as chief human resources officer for Poly-One, a polymer services company. Also in March, Gaylord Entertainment, the hospitality and entertainment company that operates the Grand Ole Opry, named former IT head **Karen Spacek** to the position of senior vice president of HR, training and develop-



ment, and corporate communications. Replacing Spacek in Gaylord Entertainment's top IT spot is **Rickie E. Hall** (left), who comes from ANC Rental, the car rental company that operates the National and Alamo brands.

### Fiscal Fitness

Bally Total Fitness, the operator of nearly 420 upscale gyms around the world, put **Gail Holmberg** in charge of trimming the fat from the company's IT organization. Holmberg, a veteran of Sears, will report to **Bill Fanelli**, Bally's senior vice president of finance.

## PROFILE: THE CIO'S CFO

**RICK PUCKETT'S I.T. BACKGROUND** makes him the type of CFO every CIO dreams about. The 49-year-old vice president (right), CFO and treasurer of United Natural Foods, a \$1.18 billion distributor of natural and organic products, has eight years of IT experience. Prior to joining the company last January, Puckett served as CIO for Suntory Water Group, a bottled water distributor. He was also responsible for IT at General Cable and Misco North America.

Because he's worn both the CIO and CFO hats, the soft-spoken Puckett has a unique perspective on the differences between the two roles, how tension can arise, and how it should be diffused. He believes conflicts between CIOs and CFOs stem from the different time frames in which they operate. CFOs live in a world of monthly reports and quarterly earnings. CIOs, on the other hand, deal with IT projects over several months, if not several quarters.

Conflicts also flare up over ROI (no surprise there). When Puckett took over as CIO of Suntory's IT staff of 65 employees, they were wary because "they thought they were going to have to do ROIs for everything," he says. Puckett won them over by focusing on what they could learn from each other and by sharing the goal of making IT an integral part of the corporate strategy. They were able to save \$1.5 million by consolidating systems, eliminating redundant services and designing a more efficient network. He still made his staff do ROIs, though. "That's what we should be doing in the CIO role," he says. "Having a sensitivity for what things cost and how things benefit the company in terms of ROI is a very positive thing."







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COMPUTER ANIMATION STUDIO CONQUERS ITS

# Information Storage Challenge



## Prologue

Daredevil and Babe the talking pig were powerless to solve the mounting data storage problems encountered by Rhythm & Hues Studios, the computer animation and visual effects shop that helped bring these movie heroes to life.

That titanic task fell squarely on the shoulders and IT staff of Mark Brown, VP/technology of the Marina Del Rey, Calif.-based firm, which in the mid-'90s won an Academy Award for its groundbreaking visual effects in the film *Babe*. Lacking superhuman powers, Brown's group still managed to save the day by pulling off a sweeping storage infrastructure overhaul with advanced network-attached storage (NAS) systems linked to bigger-bandwidth backbone connections.

"We're a storage-centric business," explains Brown. "Yes, we do art, but our infrastructure is all based around our use of storage, which is our lifeblood." The movement and storage of huge graphics files by Rhythm & Hues' 450 artists, producers and support staff have pushed the firm to 10 terabytes of storage today—and an estimated 40 to 50 terabytes within two years.

To overhaul this storage infrastructure, Brown and his staff needed to set a new bar for storage and networking tasks. These tasks would revamp the core business process to better serve workers and customers while achieving critical performance and financial goals.

## SCENE 1: The Challenge

Prior to the infrastructure overhaul, R&H artists would start their day by logging in via their 100Mbit/sec Fast Ethernet pipes and

identifying the files containing the scenes they needed. They then would proceed to construct, revise, store and eventually move the scenes to film for the firm's client list of movie-makers, commercial creators and theme-park ride operators.

Most of the roughly 250 artists were accessing and working on the same scene files, which were continually increasing in size while infrastructure bandwidth and storage stayed the same. Increasingly, this practice caused network and server bottlenecks—resulting in delays—as the pipes and attached devices became overloaded. The bottlenecks in turn caused expensive downtime.

"When workers are idle, just staring at the walls, that costs us real money, as 90% to 95% of our costs are labor," Brown says. "Coming to a grinding halt is a very painful experience, especially toward the end of projects, when artists work seven days a week to make deadlines." The company already runs a three-shift, 24-7 operation.

To tackle this bottleneck/downtime challenge, Brown and his staff leapt into action. They knew from the outset that failure to

**BlueArc absolutely delivered what it promised to Rhythm & Hues.**

—Mark Brown

address storage and networking needs would result in decreased productivity and increased customer retention and acquisition costs in an already competitive, price-conscious and deadline-driven industry.

The group decided to install NAS systems that could deliver the highest availability and performance, as well as support super-high capacity network connections, all at an attractive price, and all deemed critical in support of new high-end workstations that would be five times faster than their predecessors.

"Any time we can make a purchase of storage technology that effectively enhances our ability to do things faster, do things better and with less human intervention, that's sure better for us," says Brown. The newest desktop computers—dual-processor workstations running Linux and equipped with 80-gigabyte hard drives—have indeed helped the artists work faster, better and more independently.

In evaluating NAS systems vendors, including BlueArc Corp., Network Appliance, Scale8 and Zambeel, Brown focused on four criteria: performance, cost, bandwidth and custom solutions. "We needed a vendor that realizes we're not a one-trick pony," Brown says. "We don't necessarily always need just an off-the-shelf piece of equipment—we need something that's tailored to our environment."

## SCENE 2: The Choice

In the end, innovation won out. Brown and staff selected BlueArc's SiliconServers, largely because they use an innovative architecture designed to send server performance skyward by putting functionality not in soft-

## Why BlueArc?

**BLUEARC** Corporation, a leader in high-performance, highly scalable network attached storage (NAS), has created a SiliconServer Architecture that delivers the world's only file server designed to scale beyond today's 1 Gbps networks toward tomorrow's 10 Gbps networks. BlueArc's SiliconServer Architecture moves software into programmable hardware and removes the bottlenecks that limit performance in other NAS systems on the market today.



Custom Publishing



ware (as its rivals do), but in programmable hardware—a key difference the vendor says triples device performance.

"The BlueArc server architecture gives you NAS on steroids by delivering a big boost in speed and a marked acceleration of throughput," says Brown, whose firm now uses four of the vendor's NAS servers. When connected to R&H's Extreme Networks switches using 1Gigabit Ethernet backbone pipes, the boxes register higher performance statistics over the company's prior system configurations. Among the benefits:

\$100,000 server to handle the extra load:

- The minimal administration and maintenance required by the BlueArc servers means that R&H can avoid hiring the three full-time

directly with their engineering team," says Brown. "We had one or two engineers here at almost all times, and they were constantly on the phone with us. They worked with us

**It's not good enough to drop a product in and say, 'Here you go.' The thing we had with BlueArc was when the product came in, they worked closely with us to make sure the product matched our expectations.**

—Mark Brown

workers Brown estimates would be needed to support products using direct-attached storage (DAS) or storage-area network (SAN) systems;

extremely closely over six months to make sure that the product fit our needs, and our needs didn't just fit the product."

The partnership also extended to R&H's top networking vendor, Extreme Networks, which makes the switches to which the SiliconServers are linked. BlueArc worked closely with Extreme to ensure that their respective products worked smoothly together, even after Brown's group asked the server maker to add some enhancements to its systems.

## About Rhythm & Hues

**Rhythm & Hues**, the 15-year-old computer animation and special effects studio, gained top industry recognition in the mid-1990s for its work on *Babe*, the film about a talking pig, which earned the firm an Academy Award.

Since then, the Marina Del Rey, Calif.-based company has worked on such big screen hits as *The Sixth Day*, *Daredevil*, *Scooby-Doo*, *Behind Enemy Lines*, *Men In Black II*, *The Sum of All Fears* and, most recently, *X-Men 2*. The firm has done the same work for such television commercial characters as the

Geico lizard, the Coca-Cola polar bears, and for the StarTrek experience setup in Las Vegas.

Mark Brown entered the field of visual effects in 1993. He brought 20 years of technical expertise to R&H, and claims he wouldn't change his career decision for all the money in the world.

"It's just so amazingly cool and fulfilling to watch a movie we've worked on and get listed in the credits," smiles Brown. "And the company receiving an Academy Award for its talking animal work in *Babe* was a watershed event."

For more information about Rhythm & Hues, visit [www.rhythm.com](http://www.rhythm.com).

## Performance Improvements

- The size of file reads and writes have more than doubled, from 45 megabyte reads and 20 megabyte writes per second to 110 megabyte reads and 90 megabyte writes per second;

- A selected scene file requiring ASAP rendering took six hours before the overhaul, but only 15 minutes afterward;

- The cost per megabyte of storage for R&H plummeted 50% to 5 cents per megabyte;

- Backbone bandwidth more than tripled.

## Cost Avoidance

- R&H can add 1.5 terabytes of storage across the three BlueArc boxes for \$25,000, one-quarter the cost of buying a new

- Staying with a NAS system architecture enabled R&H to avoid having to buy additional hardware needed to switch to a SAN scheme, which Brown says was not best suited to the firm's business process.

Brown won't quantify the "substantial" savings R&H realized by choosing the BlueArc servers over competing NAS servers, but he does stress the business benefits of the savings combined with the expenses avoided. "[These savings] are passed along to customers in the form of lower rates for our services, and help us stay in the hunt in the bidding for new business."

Another key, differentiating value brought by BlueArc: partnership. "When we first started working with BlueArc, we worked

## SCENE 3: The Climax

On the first day after the full-day installation, the BlueArc box, a 1.5 terabyte system, was put into service. Within just 12 hours, Brown recalls, workers had filled 1.2 terabytes, and people were happy. The downtime was gone. "It allowed us to remove all our data bottlenecks, which meant my system administration team could go on to dealing with other things instead of having to deal with day-to-day trivial aspects of data bottlenecks."

Brown's bottom line: He's solved today's daunting data bottleneck problems with a system designed to work well into the future—which includes the likely use of emerging 10 Gigabit Ethernet networking technology to link SiliconServers. That solution, Brown says, "frees us to put more work into the art and less work into the infrastructure."●

To schedule an appointment with **BLUEARC** to discuss your organization's 2003 storage plans, or to learn more about how BlueArc's network attached storage products and services can save your business time and money, please visit [www.bluearc.com/ciomag](http://www.bluearc.com/ciomag) or call 1-866-864-1030.



## CHIP TECHNOLOGY

# A Smart Card Day in Paris

**IN PARIS, IT'S HARD TO IMAGINE A DAY** without smart cards. Invented in France in 1979, the small plastic cards get their brains from a computer chip that can be programmed to allow consumers to chat on their cell phones, buy baguettes and ride the metro. Equipped with a password, they can be used as security devices at office complexes and military bases.

While smart cards have been slow to catch on in North America, Europe built its banking networks using the technology instead of the cheaper magnetic strip cards U.S. banks favor. To convert U.S. banks to smart cards would cost more than \$12 billion, according to analysts at Frost & Sullivan. But as security concerns mount, U.S. banks will likely make the switch, says Can Elbi, an Amsterdam-based IT hardware analyst for Credit Suisse First Boston.

The following is a look at how smart cards pervade a Parisian's life, using a fictional character named Isabelle who works as a computer programmer in the modern suburb known as La Defense and lives with her husband, 3-year-old daughter and seven smart card applications.

**7 a.m.** Isabelle wakes up to the ringing of her cell phone, which like all GSM (global system for mobile communication) phones contains a smart card chip. It's her boss asking her to report to work early. This version of the smart card, known as a Subscriber Identity Module, or SIM card, can be moved into a new phone, allowing the user to keep stored information such as directories and voice dialing commands.

**7:25 a.m.** On her way out the door, Isabelle asks her husband to take their daughter to preschool. Once outside, Isabelle steps into a local boulangerie and pays for a croissant with her Carte Moneo, a so-called stored value card. Moneo lets consumers store up to 100 euros (US\$110) on the card. Isabelle has Moneo installed on her regular bank card and regularly "charges up" the card at an ATM.

**7:40 a.m.** Isabelle sails through the metro turnstile with a swipe of her Navigo smart card. (A sensor on the turnstile can read the Navigo pass from a distance of several centimeters).

**8:15 a.m.** Our heroine arrives at work at La Defense. She waves a smart card near the door's security reader to gain access to her office building.

**8:30 a.m.** Isabelle arrives at her meeting. Her boss says she must visit a client near L'Opera to help with an unexpected software glitch.

**8:45 a.m.** Back on the metro with her Navigo card.

**9:25 a.m.** Isabelle arrives at the offices of Societe Generale, a French bank just next to L'Opera. Before working on the client's glitch, she needs to check her e-mail. She flips open her laptop, connects to the Internet and inserts a smart chip (which she stores in a USB plug carrier on her key chain) into the

USB slot on the computer. She is authenticated by her company's network.

**11 a.m.** Isabelle has solved the software glitch and says au revoir to the client. She calls her friend Natalie and makes a lunch date at the bistro Chartier. When she pays, the waiter comes to the table with a portable card reader. Isabelle types in her PIN, and the money is automatically transferred from her account to the restaurant's.

**2 p.m.** Back in the office, Isabelle gets a call on her cell phone. It's the preschool saying her daughter has a fever, and can she come pick her up now.

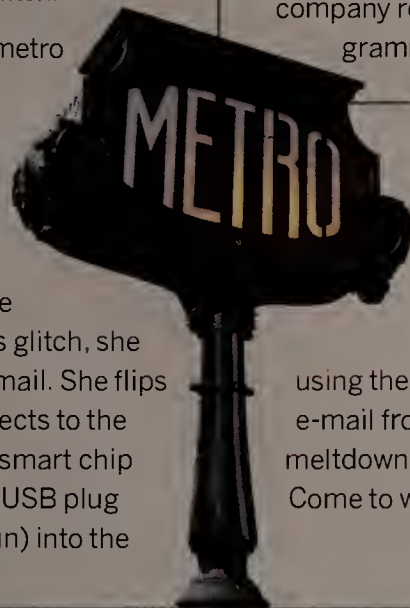
**3:30 p.m.** Isabelle takes her daughter to the pediatrician, who diagnoses an ear infection. She takes a prescription for antibiotics to the local pharmacy and pulls out her Carte Vitale, a smart card issued by the state that documents health coverage for her family.

**3:45 p.m.** On the way back home, Isabelle and her daughter pass a toy store. They duck inside and Isabelle pays a few euros for a coloring book using her Moneo card.

**4:10 p.m.** Back at home, Isabelle activates her cable television service so that her daughter can watch cartoons. The cable box contains a smart card that lets the cable company regulate Isabelle's programming remotely.

**7:30 p.m.** Isabelle's husband calls. He'll be home late. With her daughter snoozing, Isabelle opens her laptop and logs on to her company's network using the smart chip. She opens an e-mail from her boss: "System meltdown at Societe Generale. Come to work early tomorrow."

—Susannah Patton





# By the Numbers

By Lorraine Cosgrove Ware

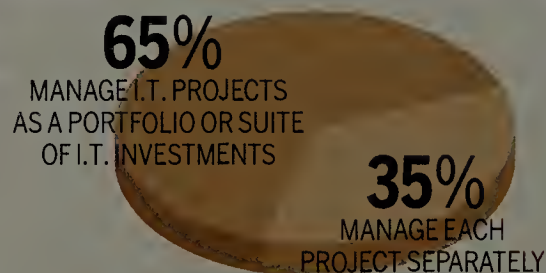
## Manage IT as a Portfolio

**PORTFOLIO MANAGEMENT** takes a holistic view of a company's IT portfolio. It compares technology investments in terms of risk and payoff to the business and then helps you prioritize investments accordingly. Survey results show that CIOs who practice IT portfolio management get a higher value from their IT dollars. A recent study conducted by PRTM, the InterUnity Group and CIO found that leading companies use portfolio management. These market leaders deploy IT more selectively and are better able to focus their IT spending on technologies and projects that support the company's business strategy. (For more on this, see "Portfolio Management: How to Do It Right," Page 56.)

### Two-thirds of CIOs manage IT as a portfolio.

The other third still haven't gotten the message.

SOURCE: CIO'S "THE STATE OF THE CIO 2003" SURVEY



## Best Practices

**Trim the fat.** Define application strategy top-down and by how it supports business goals. Prioritize the portfolio of potential projects in accordance with business priorities. Cancel low-value projects and direct those resources to higher priority initiatives to achieve greater returns. Many companies overload the pipeline with the belief that more projects will result in greater output. In fact, the opposite is often true—overloaded pipelines can lead to longer project cycle times and increased waste.

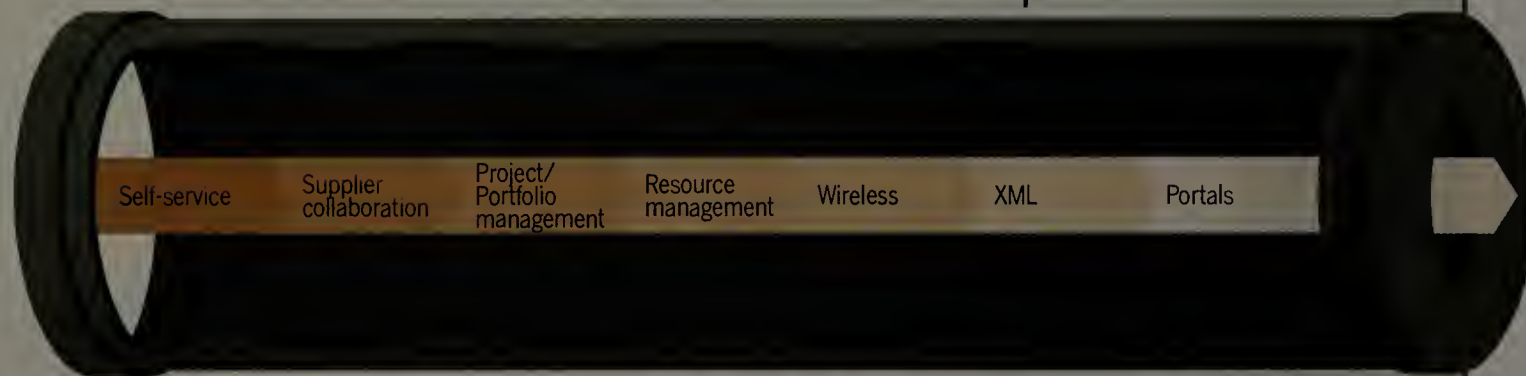
**Know where to invest.** Emphasize technology that helps your organization make better decisions. Market leaders invest more heavily in tools like decision-support applications. The study shows that some companies have a lack of automation in some areas and are over-invested in others.

**Plan ahead.** Maintain a rolling three-year road map for key process and system platforms. Update your plan throughout the year rather than creating a last-minute portfolio 60 days to 90 days before the budget forecast is due.

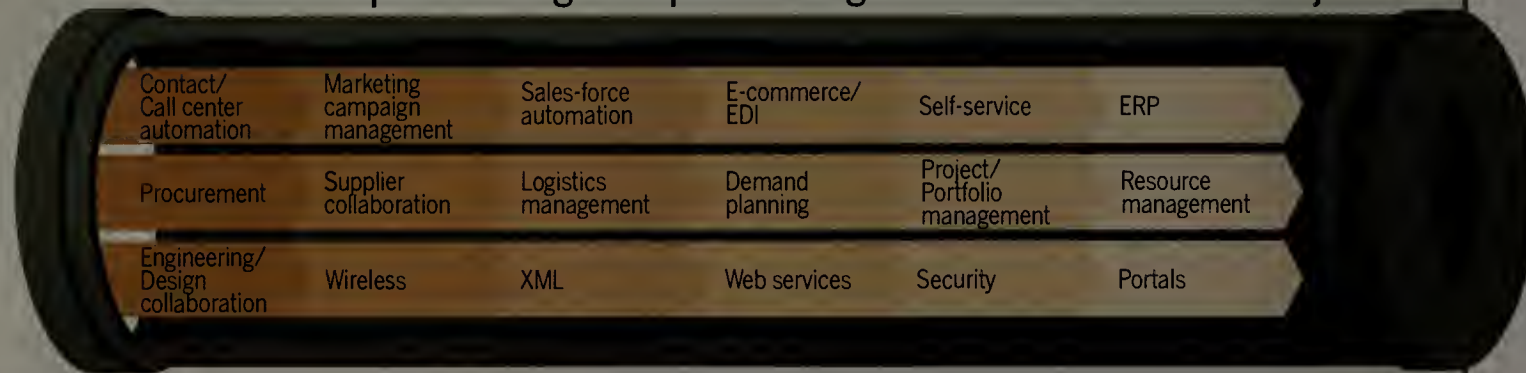
### Companies that are market leaders spend the same amount on IT as other companies,

but they are focused on fewer, more strategic projects. Align yourself with these companies.

#### Market Leaders Have Less in the IT Pipeline



#### Other Companies Assign a Separate Budget and Schedule to Each Project



MARKET LEADERS WERE SELECTED ON THEIR OVERALL BUSINESS PERFORMANCE (REVENUE GROWTH AND PROFITABILITY) AS WELL AS THEIR BUSINESS PERFORMANCE WITHIN THEIR RESPECTIVE INDUSTRIES (REVENUE, NET INCOME, GROSS MARGIN, OPERATING EXPENSES AND MARKET SHARE).

SOURCE: "OPTIMIZING BUSINESS PERFORMANCE: USING I.T. FOR COMPETITIVE ADVANTAGE," A JOINT STUDY SPONSORED BY PRTM AND THE INTERUNITY GROUP, IN CONJUNCTION WITH CIO, AUGUST 2002. RESULTS ARE BASED ON 58 RESPONSES



## Out-of-the-Box Best Practices



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LAW ENFORCEMENT I.T.

## Database Cracks Murder Case

ON WEDNESDAY, JAN. 29, 2003, police arrested 69-year-old Gerald F. Mason for the murder of two El Segundo, Calif., patrolmen. In 1957.

The breakthrough came more than 45 years after the case was closed when, after receiving an anonymous tip, investigators ran fingerprints taken from the car they believed was the murderer's through the FBI's new national fingerprint database. The prints from the car matched a set of Mason's on file in South Carolina from when he served time in prison for burglary in 1956.

On March 24 in Los Angeles, Mason pleaded guilty to the murders and was sentenced to two terms of life in prison.

The database, which went live in July 1999, is the culmination of 10 years' work. However, says FBI spokesman Steve Fischer, the idea is much older. "The FBI has been creating a national fingerprint database of subjects arrested for criminal offenses since 1924," he says. But before 1999, this fingerprint library had been maintained only in hard copy form on fingerprint cards. That made national searches next to impossible. Now, searching a set of prints against the 45 million on file takes only a couple of minutes.

The hands-on work for the \$640 million database started

in 1995, when the hard copy prints were converted into electronic images and then compressed to one-fifteenth their original size. Currently 40 terabytes of these compressed files are stored on CDs, and the system searches through them jukebox-style, spinning through disk after disk looking for a match. It's decade-old technology, but Fischer says it was the best bang for the buck when the project started.

Of course, most law enforcement agents wouldn't care if a man behind a curtain was pulling levers as long as the database works. The application is so promising that Los Angeles has reopened 3,000 unsolved homicides. "The message is this," said El Segundo Mayor Michael Gordon after Mason's arrest. "If you commit a crime in this city—whether it's five days ago, five weeks ago, five months ago, or 45 years ago—we will not give up until you are brought to justice."

—Ben Worthen

In Los Angeles court on March 24, 2003, Gerald Mason pleaded guilty to the murders of two policemen in 1957. A national fingerprint database helped investigators solve the case.

## This Date in IT History

2



The first 10 licenses for commercial television are granted on this day in 1941 by the FCC.

NBC owns Channel 1, and it broadcasts from the Empire State Building (above). Sixty days later, 4,000 TV sets around New York City are tuned to see NBC's first telecast, a Brooklyn Dodgers versus Philadelphia Phillies baseball game at Ebbets Field. The Phillies win 6-4.

8

An ocean of junk mail shuts down the computer networks of high-profile spam propagator Cyber Promotions for 20 hours in 1997. The counterattack against the company and CEO Sanford Wallace, a.k.a. the Spam King, is a temporary setback. A year later, Wallace closes shop and becomes a consultant to spam victims.

14



A long time ago (1944), in a Modesto, Calif., suburb (far, far away), film and special effects guru George Lucas is

born. Just after his 18th birthday, Lucas's seat belt snaps and he is ejected from his tumbling vehicle moments before it wraps around a tree at 60 mph. Lucas awakens in the hospital with a vision of a three-part story that later becomes the *Star Wars* trilogy. The first film opens in 1977.

19

The Justice Department along with 20 states file an antitrust suit against Microsoft in 1998, claiming it uses its Windows desktop dominance to suppress competition. Microsoft denies the charge and fights the suit. A federal judge approves a settlement in 2002.

20

Referred to as the most widespread digital failure ever, the Galaxy 4 telecommunications satellite conks out and causes tens of millions of

paggers to go silent in 1998. A majority of the pager market had relied on the Galaxy 4 to run their services. Pager companies scramble to link their services with another satellite.

26



Adobe Systems cofounder and President Charles Geschke is kidnapped in 1992 in broad

daylight from the parking lot of the Mountain View, Calif., company. Geschke's captors set the ransom at \$650,000, threatening to kill him and blow up his home if their demands aren't met. Authorities rescue Geschke four days later, unharmed. He returns immediately to his post at Adobe. Later, the two kidnappers are sent to jail for life.

28

In the first major display of dissent since the Microsoft antitrust filing, Gateway announces in 1998 that it will modify Windows 98 and offer consumers a choice of Web browsers. Microsoft reluctantly grants permission to Gateway to include Netscape Navigator on the desktop.

31



Apple cofounder Steve Jobs loses his job in 1985 as head of the Mac division in a power struggle with CEO

John Sculley (above). Ironically, Sculley, a proven PepsiCo leader, had joined the company in 1983 at Jobs' urging. Sculley remains the Apple CEO until 1993. Three years after that, Jobs returns to Apple and reclaims the CEO spot.

—Daniel J. Horgan

SOURCES: WNBC, BASEBALL ALMANAC, THE HISTORY CHANNEL, FILMMAKERS.COM, ULTIMATE STAR WARS SITE, CNN, THE CENTER FOR THE STUDY OF TECHNOLOGY AND SOCIETY, ABOUT.COM, SILICON VALLEY STORY, APPLE



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# Mohanbir Sawhney | Net Gains

Creating Value Through IT

## How to Keep Your Customers Satisfied

To learn if end users are happy, you have to ask the right people—and the right questions

**JUST AS CUSTOMER SATISFACTION** is a key goal for companies, ensuring end users are satisfied is an important responsibility of CIOs. In *CIO*'s "State of the CIO 2003" survey, 63 percent of respondents said they regularly measure either internal or external customers' satisfaction with IT's services. But only 36 percent said this is a highly effective practice for adding value to their business. The discrepancy isn't surprising. My experience with customer satisfaction measurement in the technology industry suggests that companies—and by extension CIOs—often talk to the wrong people in the customer organization and measure the wrong things. If you aren't careful, customer satisfaction measurement could be doing your IT organization more harm than good. Here are some tips for getting customer satisfaction measurement right.

### Measure Success, Not Satisfaction

Consider the experience of Trilogy, one of the largest privately held software companies. Trilogy employed a classic multivariable customer satisfaction measurement system. It contracted respected outside companies to hone a 40-point index address-

ing all major drivers of customer satisfaction. Semiannually, these companies would survey a cross-section of customers and analyze and report this data to management. Trilogy management took the results very seriously. Then one day, only a week after Trilogy executives were congratulating themselves on a key customer's high satisfaction ratings, a senior executive from that account threatened to shut down its project.

What went wrong? Trilogy found that its surveys focused on many intermediate metrics, such as "Do you like our people?" or "Are we easy to work with?" But these measures shed little light on the *end result*: Was the customer's experience with the software project a success? Trilogy realized that customers do not care about the technical merits of the software or the responsiveness of the account manager. Customers initiate projects to drive specific operational and financial changes in their businesses. The only thing they care about is the actual *business*

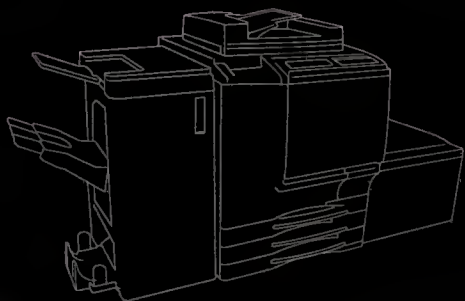


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*value delivered* by the vendor. Trilogy now measures *customer success* on a set of “business success metrics” established jointly with each customer. These metrics are relevant to the senior business sponsor and are designed to measure the value delivered throughout the life of the project.

### Don't Let Averages Lie

Sometimes, it's not obvious who the customer really is. Enterprise technology projects involve multiple constituents with differing and often conflicting objectives. IT investment decisions involve business decision-makers, IT professionals, finance executives and end users. These audiences may define value differently.

## CIOs should work to understand how their customers define success.

For instance, in deploying a CRM system, the IT organization may care about ease of deployment and performance. The finance organization may emphasize ROI. The end users may care about ease of use and adaptability of the software to their needs. Given these differences in priorities, one audience could be satisfied while another is unhappy with the same project. An average customer satisfaction score will completely mask these differences. In the Trilogy example, the IT organization was pleased with the vendor, but the business sponsor was dissatisfied. And because the business sponsor was paying the bills, his opinion was the one that mattered.

### Loyalty Is Not Satisfaction

Just because your customers are loyal, it doesn't mean that they are satisfied. A recent study by research firm Miller-Williams of 33 companies in six industries found that loyalty does not correlate perfectly with customer satisfaction. In fact, the study found a negative correlation between satisfaction and loyalty in the software industry. The likely explanation is that enterprise software has high switching costs, so customers are loyal to their vendors even if they aren't happy. Customers of Microsoft find it difficult to switch from Microsoft Office and

Windows because the company dominates the desktop applications and operating systems market. As I tell my friends at Microsoft, there is a difference between loyal customers and hostages. As Microsoft is finding out with the Linux threat in the server business, the true test of loy-

alty is to retain your customers when they have a real choice.

### Replace Ritual with Reality

Sometimes, customer satisfaction programs take on a life of their own. Consider the auto industry. Dealers of luxury autos often reward their sales personnel based on customer satisfaction surveys. However, that practice has unintended consequences, as one of my friends discovered while buying a car from an Acura dealer. Even before the customer satisfaction survey had been mailed out, the sales representative hinted that nothing less than an exceptional rating would do. Another example of good intentions gone awry comes from my experience during a recent stay at the Sheraton

World resort in Orlando. Sheraton recently rolled out its “Sheraton Service Promise.” It pledges to compensate guests for any inconveniences. When I checked into my room, I found that the toilet was leaky and would not

stop running. I called the front desk and was offered a coupon for a free breakfast. But when I returned to my room in the evening, the toilet still hadn't been fixed. I left annoyed early the next morning without having time to eat my free breakfast. As far as Sheraton was concerned, I was satisfied, but it never solved my problem.

### Lessons for the CIO

The same ideas for satisfying customers of a company's products and services can help CIOs serve their customers. While service-level agreements (SLAs) are the norm for managing relationships with external IT service providers, many IT organizations don't have internal SLAs that define expected services to end users and penalties if those service levels aren't met. In addition, CIOs should work to understand how their customers define success. That requires a close partnership with end users to understand the business outcomes that they seek and the metrics that should be used to measure business value from their perspective. Finally, IT organizations should not forget that business units aren't captive customers whose loyalty can be taken for granted. CIOs who can't satisfy end users may find their jobs on the line.

Ultimately, whether you deal with external customers or internal customers, the only way to make yourself successful is to make your customers successful. While satisfaction does not guarantee success, customer success does guarantee customer satisfaction. **CIO**

Mohanbir Sawhney is the McCormick Tribune Professor of Technology at Northwestern University's Kellogg School of Management. He can be reached at [mohans@kellogg.northwestern.edu](mailto:mohans@kellogg.northwestern.edu).



#### CIO.com

Are your customers loyal because they have no choice? Give Mohanbir Sawhney your two cents when you **ADD A COMMENT** to this column online. Find the link on the [www.cio.com](http://www.cio.com) homepage.





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# Peer to Peer

Field-Tested Ideas from CIOs for CIOs

## How to Pass the Stress Test

An IT executive tells the story of his own stress-related breakdown and recovery, and reveals what you can do to avoid the abyss

BY JOHN L. HAUGHOM

**THERE IS A GREAT SCENE** in the 1990 movie *Days of Thunder*. Tom Cruise is a race car driver screaming around a racetrack in a noisy blur of smoke and color. Coming into a straightaway, he puts his foot right to the floor. The car roars, the tachometer leaps up into the red, and the engine promptly explodes. The car loses all speed and limps to the side of the track, useless. Cruise had pushed it too far, and as a consequence, it died.

Unfortunately, many executives in the business world have also got their foot to the floor, unaware that burnout lies just around the corner. The consequences can be disastrous and costly, not only for the individual but also for the company.

I should know. For more than 25 years, I believed I could accomplish just about anything professionally. And I often did. Following medical school, I enjoyed 15 years of practice before accepting a senior leadership role in PeaceHealth, a nonprofit health-care organization in the Pacific Northwest. My job quickly grew until I had responsibility for corporatewide clinical quality and all information technology initiatives. In 1994, PeaceHealth launched an aggressive campaign to implement an advanced IT infrastructure supporting both operations and

clinical care. The centerpiece of the effort was our Community Health Record project, a network of communitywide medical records designed to support patient care in each of the communities we serve.

Little did I know how difficult this role would prove to be. Resistance was monumental and seemed to come from everywhere in the organization—from skeptical board members and executives to hostile physicians. My workday typically began by 6 a.m., when I would send e-mails and return voice messages from home. Arriving at the office before 7:30 a.m., my days were characterized by a blur of conference calls, tense meetings and voluminous e-mail exchanges. Around 7 p.m., I would stagger out of the office to catch a quick meal with my wife, before heading to my home office where I would continue working until 10 or 11 p.m. My four sons grew accustomed to not seeing their dad even on the weekends.



ILLUSTRATION BY JAMES YANG





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Despite the resistance, with the staunch support of my CEO, we literally moved mountains. In roughly four years, PeaceHealth went from virtually no automation to a highly advanced infrastructure including a full-blown electronic medical records system supporting care in all of our hospitals and clinics with nearly everything online.

However, managing the project was the most stressful job I had ever undertaken. In the summer of 2000, my engine reached its breaking point.

Each night I would lay in bed and replay my day at work, sleeping only a few hours. At the office, I uncharacteristically began snapping at people. My colleagues began wondering what happened to the affable, mild-mannered, resilient "old

### **In the summer of 2000, my engine reached its breaking point. One morning, I found it difficult to even get out of bed.**

John." Finally, one October morning, I realized that I could not go on. I literally had no reserve, finding it difficult to even get out of bed, much less manage my professional responsibilities. Admitting this to myself was one of the hardest things I have ever done, but it was also one of the most important.

My boss, the corporate CEO, graciously granted me a three-month sabbatical. A couple of days into it, I sought professional help from the Professional Renewal Center, an outpatient center dedicated to helping executives deal with stress. It turned out to be exactly the right thing to do.

#### **The Stress Epidemic**

During this ordeal, I learned that I was far from unique. The incidence of work-related stress is rapidly rising in today's high-speed business world. With greater demands at work and new technology that blurs the boundary between home and job, it is increasingly hard to "switch off." Several recent studies show that stress in the workplace is skyrocketing. According to a new study by the National Institute for Occupational Safety and Health, more than half of working Americans view job stress as a major problem in their lives. That's more than double the percentage in research conducted 10 years ago.

Burned-out workers become disillusioned, frustrated, resentful and aggressive. Their work performance may shift from impressive to barely adequate, or they may leave the organization. The bottom line is that this can be very costly for companies, especially as burnout tends to target employees who are highly dedicated—just the workers you want to keep. (To read more, see "Staff Alert" on Page 72.)

I was lucky. With rest, counseling and introspection, I rediscovered myself and my zest for life. Equally important, I learned vital coping and stress management skills that have allowed me to return to work and be as productive as before, yet with a healthier balance of my professional and personal life. I feel as though I have been given a great gift. I returned to work armed with new insights on leadership. I learned that one's ability to lead is not strictly based on MBA-like skills. The efficacy of leadership also depends on how you respond to the demands and challenges of your position, internal conflicts or interpersonal struggles. By better understanding myself and my response to my environment, I was vastly better prepared to handle the complexities of my role. I have learned that if a situation begins to trigger anxiety or stress, I should quickly recognize it and identify the reason. If these internal conflicts are recognized, they are almost always easy to resolve, allowing me to focus on the bigger picture. This has allowed me to approach even the most complex and demanding situation with the calm, dispassionate demeanor necessary to resolve it. In addition, I have learned to manage my personal life as rigorously as my professional life. This includes shutting down every night no later than 7 p.m. to pursue personal interests, and religiously guarding my weekends and regular vacations.

By demanding this balance in my life, I have become more productive, not less. Those around me have seen a noticeable difference. Colleagues have complimented me on my equanimity even in the most difficult situations. They frequently comment that it is nice to see the "old John" back. Many have privately told me they admire my willingness to seek help and openly share my experience.

There is no question that I could not have negotiated this significant life challenge without the strong and unwavering support of those around me, particularly my wife and family. In addition, many PeaceHealth colleagues were supportive, especially my boss, PeaceHealth CEO John Hayward. Without his commitment and support, it is much less likely that my journey toward recovery would have been successful.

A year ago, PeaceHealth launched an initiative to improve the patient experience and help reduce stress among its employees. In my case, PeaceHealth fulfilled that mission in a deeply personal way. For that, I will always be indebted. **CIO**

John L. Haughom is senior vice president of health-care improvement at PeaceHealth, a private network of hospitals in the Pacific Northwest. If you have stressful stories you'd like to share, contact Executive Editor Alison Bass at [abass@cio.com](mailto:abass@cio.com).





# STRATEGIC DIRECTIONS

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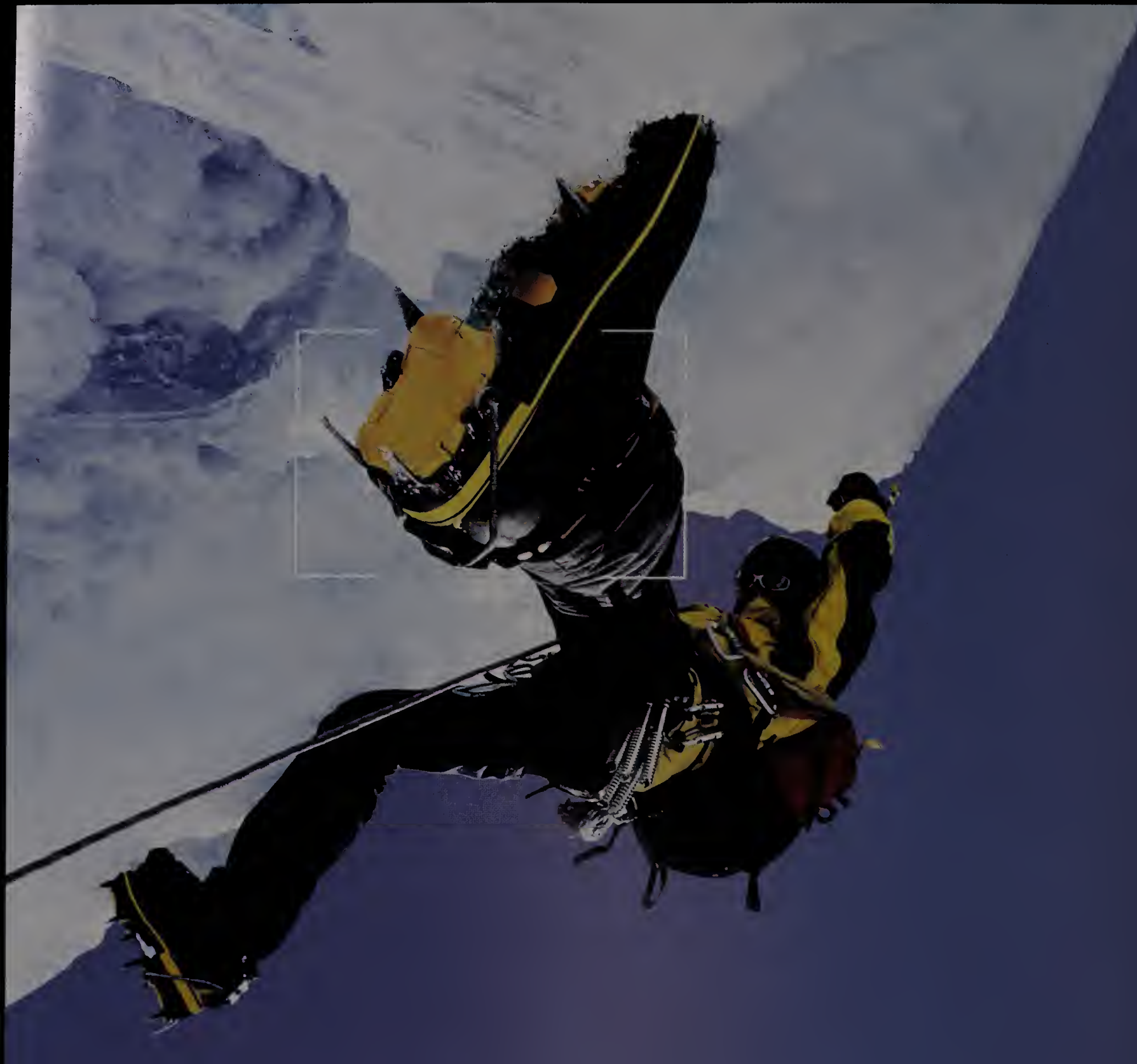
## Security: New Reality Check

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To learn more about the importance of security in industry, please visit us at [www.sterlingcommerce.com/go/cio](http://www.sterlingcommerce.com/go/cio) before May 30, 2003. The first 100 visitors will receive a free copy of the popular hardcover book, *Network Security: PRIVATE Communications in a PUBLIC World*, by Charlie Kaufman.





# SECURITY

## THE #1 TOPIC ON LEADERS' MINDS

**W**elcome to the new year of *Strategic Directions* — and to what we call the “new reality check” of managing information security threats and business continuity challenges.

*Strategic Directions* is the ongoing series of CIO and CSO supplements, produced by CXO Media's Custom Publishing group, focusing on the key business-critical technologies and solutions of the day. Through research, analysis, case studies and vendor profiles, *Strategic Directions* provides an executive-level primer to the hot topics on the minds of senior IT and business leaders.

And no topic is hotter right now than security.

How many times has one of your networks or systems been attacked in the last year? What happens if your website goes down for even an hour, or if a key corporate database goes offline for a day? What will the interruption cost your organization?

And what about your partners and suppliers? Can your operations survive a failure in telecom services or DNS servers?

This *Strategic Directions* supple-

ment, the first in 2003, looks at what it takes to protect the enterprise's ability to fulfill its mission — the strategies, tools and techniques CIOs and CSOs need to secure information systems, applications and networks from attack and failure, accompanied by best-practices advice and in-the-trenches case studies of what works and what doesn't.

Among the topics we tackle in this edition:

■ **DEALING WITH NEW TECHNOLOGIES:**

They're way cool and creeping inexorably into the enterprise, but they're also dangerously insecure. Should you ban them or find ways to embrace them? Whatever you do, don't ignore them.

■ **RETHINKING YOUR SECURITY STRATEGY:**

What you can do to protect your enterprise now.

■ **SOLUTIONS THAT EASE THE PAIN:** Simplifying security management; multifunction appliances; authentication alternatives and more.

■ **THE PUSH FOR PRIVACY:** Dos and don'ts that keep customers in the fold.

■ **CONTINUITY PLANNING:** As demand for the real-time enterprise grows, so does an appetite for high-availability and fault-tolerant systems.

■ **ROI CHECK:** Steps you can take to cut security overhead and prep systems and networks for future security investments.

Read on. Take notes. Tear out pages. Contact our sponsors for more information. And please let us know what you think — about *Strategic Directions* in general, this edition in particular and ideas you'd like us to tackle in future editions. Got any best-practices you'd like to share with other IT/business leaders? Send them to me; I'll pass them along in our next issue.

Thanks for reading *Strategic Directions*. And as a familiar TV cop used to say, “Let's be careful out there.” **SD**

Tom Field

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### ABOUT STRATEGIC DIRECTIONS

**Strategic Directions focuses on key business-critical technologies and solutions with in-depth coverage, analysis and market data regarding today's hot topics. There will be four editions of Strategic Directions in 2003, with future issues focusing on outsourcing, storage and CRM. For more information, visit [www.cio.com/custompub](http://www.cio.com/custompub).**



# THE SECURITY STRATEGY IMPERATIVE

## ANTICIPATING A DISASTER IS EASIER THAN RECOVERING FROM ONE

**E**xactly the event you think cannot happen will happen if you do not plan for it," says Dave Foss, manager of information systems and networking at MIT.

Too often, though, information security measures develop haphazardly, in reaction to the last attack or emergency. And too often the technologies deployed deliver only partial solutions. The result: patchwork defense full of vulnerabilities.

These days, enterprises need more than a patchwork defense. Following are some bits of expert advice for developing a smart, comprehensive security strategy.

### **SURVIVABILITY: KNOW YOUR VULNERABILITIES**

"What was once a cottage industry of hackers has now evolved into a sophisticated group of well-organized, well-connected and informed users who revel in their ability to cause disruption," says Foss.

If security is about technology, then survivability — what folks at Carnegie Mellon University's Software

Engineering Institute call "the capability of a system to fulfill its mission, in a timely manner, in the presence of attacks, failures or accidents" — is about the business.

"The real costly security concerns are those which affect your corporate bottom line," says Foss. "This includes the perception that your company cannot be trusted. If you can't keep your own data secure, why should anyone trust you with personal or business data?"

**WHEN IT COMES TO DEVELOPING A SECURITY STRATEGY, THE FIRST THING AN IT EXECUTIVE NEEDS TO KNOW IS WHAT'S AT RISK IN THE BUSINESS. THAT MEANS PRECISELY FIGURING OUT THE VULNERABILITIES**

When it comes to developing a security strategy, the first thing an IT executive needs to know is what's at risk in the business. That means precisely figuring out the vulnerabilities and creating what Omni Consulting Group calls an inventory of impacted

resources and outcome probabilities.

"If you look at security in terms of risk mitigation, you can map out your resource requirements accordingly," says Wayne Mincey, president of the technology services division at Spherion, a Ft. Lauderdale, Fla.-based HR and IT services provider.

"There are three ways to deal with risk," Mincey says. "You can live with it, you can avoid it or you can transfer it elsewhere." Which path you take depends on the probability and severi-

ty of the risk in the context of what is important to your organization. A careful eye should then be turned toward identifying your vulnerability levels (ideally in a regulated fashion) and focusing your action plans around

*Continued on page 6*



# THE ROI OF SECURITY:

## HOW TO GET THE MONEY YOU NEED — AND SHOW RESULTS

Security isn't an investment, according to Christian Byrnes, vice president for security and risk strategies at Meta Group. "It's a tax on IT-based assets required to protect the value of the assets," he says.

And, arguably, how much tax you pay depends on how much risk you face. So consider this:

- The number of vulnerabilities has been doubling since 1998, says Carnegie Mellon University's CERT Coordination Center.
- Nearly 20,000 digital attacks occurred this January, according to mi2g Ltd., a digital risk management firm. Damages exceeded \$8 billion. At that rate, 2003 will see more than 180,000 attacks doing \$80 billion to \$100 billion worth of damage.
- During a nine-hour period on July 19, 2001, the virus Code Red infected 250,000 computers, according to CERT. Code Red, SirCam and LoveBug together infected an estimated 40 million computers; repair efforts and lost productivity added up to \$12 billion.

When it comes to how much an organization should spend on security, Dave Foss, manager of information systems and networking at MIT, asks, "How much are you willing to risk?"

Consider the cost of having no security. Do you have adequate recovery plans to put your entire desktop or server environment back in operation if you're attacked? How long can you stay offline? What's the business cost of having every IT professional divert his or her attention to recovering your IT infrastructure after a security-related disaster?

The capital outlay that your security program needs depends on buy-in at the top of your organizational food chain.

And to get that buy-in, you'll have to communicate your security needs in business terms. This point can't be overstated: Information security efforts must support business objectives and business processes.

Some security experts use the 10 domain areas of

(ISC)<sup>2</sup>'s Common Body of Knowledge to elucidate security issues to business managers and end-users. These 10 domains are the following:

- Security Management Practices
- Security Architecture and Models
- Access Control Systems and Methodology
- Application Development Security
- Operations Security
- Physical Security
- Cryptography
- Telecommunications, Network and Internet Security
- Business Continuity Planning
- Law, Investigations and Ethics

Some CIOs and CSOs use risk assessments and operational metrics — like number of intrusions blocked or viruses foiled — to justify security spending and educate top management. And education really is the key to obtaining necessary funds, as well as demonstrating ROI.

"Security is often viewed as a cost center, and rightly so — it's a cost of doing business today," says Chad Robinson, senior research analyst at the Robert Frances Group. "However, because most companies seek to continually 'increase profits, reduce costs,' this often means security efforts get only minimal funding."

Having this mind-set is a serious mistake, Robinson says: "Setting a budget for security and then determining what that budget will allow almost guarantees that a security effort will fail at some point."

In the end, says MIT's Foss, "The best advice is to secure your internal systems as much as possible from intruders, realizing that no solution is perfect." Relay this plan to management and plan for the worst, without becoming obsessive. Hire experienced people and listen to what they tell you, but take it upon yourself to make the final decision based on your particular needs. "Now relax and have a nice cup of latte at your local Starbucks, and take a good look around you," Foss says. "You might end up working there if you made the wrong decisions."



## SECURITY: NEW REALITY CHECK | THE SECURITY STRATEGY IMPERATIVE

*Continued from page 4*

your risk levels.

Begin with an audit — an honest (typically external) assessment of all vulnerabilities.

“There is no way to know whether you meet the standard of due care without some form of external assessment,” says Christian Byrnes, vice president for security and risk strategies at Meta Group. “Just make sure that the program is being assessed against some defined reference. Generic reviews without a methodological basis are useless and misleading.”

You can get security audit help from any number of vendors, including

*Continued on page 22*

## FIVE NOT-SO-EASY STEPS TO MITIGATING RISK

■ **DETERMINE WHAT OPERATIONS AND FUNCTIONS ARE ESSENTIAL FOR THE BUSINESS TO SURVIVE.** Priorities become clear as you figure out the impact of losing each operation and function.

■ **IDENTIFY SYSTEMS AND PERSONNEL THAT ARE ESSENTIAL TO THE CONTINUANCE OF THOSE KEY BUSINESS OPERATIONS AND FUNCTIONS.** Then pinpoint all directly and indirectly related components and subsystems.

■ **ASCERTAIN AND EVALUATE THREAT SCENARIOS FOR THOSE OPERATIONS AND THEIR SYSTEMS.** This includes developing an understanding of what or whom business assets are being secured against and identifying

system and process vulnerabilities.

■ **USE RISK EVALUATIONS TO CREATE STRONG POLICIES AND PROCESSES — AND ENFORCE THEM.** Once established, review security policies often and expect to change them in response to evolving threats and technology solutions.

■ **DEVELOP POLICY-BASED DEFENSE IN DEPTH.** You'll need layers of protection that reduce visibility of and access to critical assets — including perimeter defenses (firewalls, IDSs, antivirus programs, etc.), encryption and a secure network operations center. Threat levels are lower when attackers can't technologically or physically touch their target.

### CASE STUDY

## KANSAS BUREAU OF INVESTIGATION TAKES RISK OUT OF SECURITY

**L**ike many organizations, the Kansas Bureau of Investigation (KBI), which maintains a Criminal Justice Information System accessed by law enforcement agencies, courts and other organizations throughout the state of Kansas, wanted to migrate from its private network to the Internet to make access to its information more affordable. And although

KBI had to comply with strict security and auditing requirements mandated by state and federal legislation, KBI's IT consultant, Norma Jean Schaefer, believed that a carefully-crafted configuration of state-of-the-art commercial products could provide the high levels of security required.

### UP AND RUNNING IN TWO WEEKS

According to Schaefer, Nokia's strategy for network security fit the bureau's needs like a glove: a purpose-built platform implemented in a choice of specially hardened security appliances that are all pre-configured with the industry's best security applications.

Using applications from three of Nokia's partners — Check Point Software Technologies, FishNet Security and Internet Security Systems (ISS) — KBI was able to get the basic security provisions up and running in just two weeks; a remarkable feat Schaefer attributes to Nokia's approach to security which stresses purpose-built appliances pre-configured with best-of-breed applications.

“The IPSO operating system on the Nokia IP Security Platform takes the risk out of installing, configuring and operating security appliances,” reports Schaefer. “There are just too many variables with a general-purpose operating system where errors in the intricate configuration can leave the network vulnerable. But with the Nokia appliances, I can have a site up in about an hour and sleep well knowing the configuration is solid.”

**NOKIA**  
CONNECTING PEOPLE

### \$13,000 VS. \$25.00

KBI also appreciates the scalable performance available across the family of Nokia IP Series appliances. The choice of different models, some available in fully redundant configurations, gives KBI a cost-effective solution

for just about every conceivable need — from the data center to the smallest field office.

“We have a lot of small counties that could not afford \$13,000 a year for a leased-line,” observes Ron Rohrer, IT director at KBI. “Now, even the smallest departments can connect for about \$25 a month.”

The project has since grown to connect some 6,000 users at 250 separate agencies, and has been an unqualified success with an estimated cost avoidance of \$2.5 million and a 300 percent return on investment during the first year.

For more information, contact Nokia at 1-877-997-9199 or visit <http://www.nokia.com/securenetworksolutions>.



## CIO keeps promise to son

Stunned family credits Nokia IP Security Systems with husband's new lease on life



Four days after promising to take his son to a football game, local businessman Gerald Anderson, follows through on agreement. "Sure, I've promised to take my son places before, but this time I actually did it. I don't know how to describe the feeling, like, well, it's like I feel good inside."

Thanks to Nokia, Gerald can trust that his network is secure so that he and his employees can spend their time using the new company-wide Cisco system — and enjoy more time with their family. Anderson isn't the only one spending his time wisely these days.

### Connecting the right people

"We get out of the Nokia Security Systems," employee Dean Weiner "is freedom. And with freedom I can be focused, creative, and of all, more productive. And it starts the moment I work away from my office — at my favorite I'll admit I wasn't the biggest advocate 'quality time' hooey, but let's be honest, time the family beats time worrying about network rity hands down," declares Anderson. "With securing my business, I am able to spend more with my family even though my business is faster than ever before. What does Anderson Ben, think of getting to spend more time father? "It's cool cause we get to go to all the lot of other stuff now, but sometimes

**Find out why industry leaders and the world's leading financial institutions choose Nokia security systems.**

The more complex your business becomes, the more you need secure and reliable connections to your corporate network. When you combine the world's best VPN/Firewall software from Check Point Software Technologies and Intrusion Protection from Internet Security Systems™ (ISS) with Nokia platforms and management applications, you save time and resources,



gaining flexibility and reliability. Only Nokia takes a complete system approach to network integrity with full integration of best-of-breed applications on purpose-built platforms that are easy to deploy, operate and manage, backed by First Call – Final Resolution global support.

To spend more time at home, visit [www.nokia.com/get\\_a\\_life/americas](http://www.nokia.com/get_a_life/americas)

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## SECURITY: NEW REALITY CHECK | NEW RULES &amp; REGS

# NEW RULES & REGS

## HERE ARE SOME SECURITY REGULATIONS AND CERTIFICATIONS TO NOTE

**I**ntensifying security- and privacy-oriented regulation — especially in those industries considered part of critical infrastructure (e.g., energy, utilities, finance, health-care, transportation, communication) — is reshaping the nature of corporate officers' fiduciary responsibility and what it takes to manage secure IT environments.

Among the regulations with security implications are the following:

**THE U.S. HEALTH INSURANCE PORTABILITY AND ACCOUNTABILITY ACT (HIPAA)**, which ensures the security and confidentiality of health-related data and standardizes electronic data interchange for health-care organizations

**THE GRAMM-LEACH-BLILEY ACT (GLBA)** mandates HIPAA-like protections for

financial data.

**THE NATIONAL SECURITY TELECOMMUNICATIONS AND INFORMATION SYSTEMS SECURITY POLICY (NUMBER 11)** took effect in July 2002; it requires that all software purchased by the government for use in a national security setting be tested to ensure it's secure.

And then there's the **SARBANES-**

*Continued on page 10*

### COMPANY PROFILE

## KEEPING THE MOBILE WORKFORCE MOBILE

**D**o you know the impact to your company's bottom line when your mobile workforce is down? A workforce unable to communicate with clients, without access to vital information, can cut into productivity, lead to lost revenue opportunities, erode market share and damage profitability. How can you safeguard your bottom line against the problems associated with mobile workforce downtime?

One global pharmaceutical company found out when it secured Spherion's comprehensive solution for laptop depot services to support its large, mobile U.S. sales force. By minimizing exposure to downtime, this company enhanced the efficiency of its organization while preventing loss of both critical data and potential revenue.

When people are stopped in their tracks by stalled technology, patience may be a virtue but it's usually in short supply. That is why this firm put a high premium on speed. It wanted 24-hour turnaround on repairs and no more than a 60-second hold time on calls. It wanted 80% of its calls resolved immediately and it had very little tolerance for hang-ups.

### QUICKLY AND SEAMLESSLY

Moving quickly and seamlessly to a new support environment, Spherion commissioned a dedicated team to oversee the transition and ensure that there was no service disruption to the client's sales force. It worked with the client to detail hiring criteria, data security documentation, escalation and notification procedures, disaster recovery and staff training.

Spherion's comprehensive break/fix solution provides a dedicated technical support staff for warranty and non-warranty laptop repairs, with a guaranteed turnaround time of 24 hours for warranted items; secure data imaging; and inventory management.

### PERFORMANCE RESULTS RESCUE REVENUE

Addressing key productivity measures to ensure minimum downtime for mobile employees, Spherion provided service that surpassed all client expectations including a 40-second call response time, a 95% first call resolution rate and a 3.4% call abandon rate.

Outstanding technical support safeguards the security of client data and protects employee productivity. Laptop repairs that once took three days are now accomplished within a single day. With more than 4,700 representatives nationwide, that means a rescue of nearly \$23 million annually in potential lost revenue.

For more information, contact [www.spheriontechnology.com](http://www.spheriontechnology.com).

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desk support 24-7, enabling them to avoid a potential \$15 million in lost business per year. Which is why nearly 90% of companies who use us, continue to use us to make their workplace work better.

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## SECURITY: NEW REALITY CHECK | NEW RULES & REGS

**OXLEY ACT**, which went into effect in mid-2002, enacting a slew of new corporate recordkeeping and auditing rules that are bound to shake up how IT pro-

fessionals store and protect data. The added costs of implementing the act's new information disclosure requirements will help justify deploying and

ensuring the survivability of an enterprisewide set of (secure) business applications built around a (secure) database.

These compliance requirements are, in turn, triggering new need for the Generally Accepted System Security Principles (GASSP), expected to be renamed the Generally Accepted Information Security Principles (GAISP), which establish common compliance elements that can be mapped to security regulations and standards.

Meanwhile, ISO17799 is evolving into a de facto standard for high-level definition of an information security architecture.

Those who've met their regulatory obligations will need to show that via certification and/or accreditation.

### **"TRUST IS THE ULTIMATE FIREWALL."**

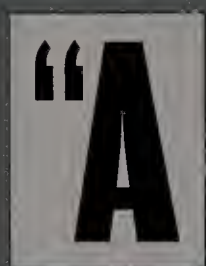
Now the U.S. Department of Defense requires that security products (and security-enabled products) be Common Criteria-certified, and the U.S. federal government may adopt this certification standard.

The International Information Systems Security Certifications Consortium's Certified Information Systems Security Professional (CISSP) and System Security Certified Practitioner (SSCP) certifications become increasingly important as a means of ensuring baseline capabilities of security professionals.

"More than tools and technology, the trustworthiness of technologists, designers, managers and administrators themselves will continue to spell the difference in the stability, growth and effectiveness of complex, networked information systems," observes Harry DeMaio, CISSP, and (ISC)<sup>2</sup> board of directors member. "Trust is the ultimate firewall." **SD**

## PROFILE

### SECURITY TRANSCENDS TECHNOLOGY



As the global network economy grows in size and complexity, information security and privacy protection require serious reassessment and modification.

Organizations are allowing more entry privileges to their infrastructures to a much wider population of partners and processes than ever before," notes Harry DeMaio, Certified Information Systems Security Professional (CISSP) and (ISC)<sup>2</sup> board of directors member. "In a sense, organizations have lowered the drawbridge to their fortresses."

So, how does an organization defend itself in this new interdependent and collaborative environment?

"Trust," DeMaio says. "A mutual trust among a range of partners and allies directly and interactively sharing infrastructure, applications, data and other resources."

#### **TRUST: THE ULTIMATE FIREWALL**

Trust in the Internet community, says DeMaio, requires answers to these questions:

- Can I trust the organizations and infrastructures on which I depend?
- Can they trust me?
- Together, can we trust our common infrastructure and processes?

"Trust is built on reciprocal protection, clear responsibilities and accepted standards," he explains. "More than tools and technology, the trustworthiness of the technolo-

gists, designers, managers and administrators themselves will continue to spell the difference in the stability, growth and effectiveness of complex, networked information systems. Trust is the ultimate firewall," he says.

#### **CERTIFIED CYBER-SECURITY WORK FORCE**

"A certified cyber-security work force has long demonstrated professional excellence, mutual trust and jealously-guarded ethical reputations," says DeMaio. "The need for such

standards has never been greater. New cyber-threats, exponentially growing networks, increased process complexity and quantum leaps in the information

user population, make peak professionalism in every sense of that word a necessity for the information security community.

"Professionalism is crucial regardless of the type or level of security practice," he adds. "To provide the strongest index of trustworthiness for the growing diversity of professionals in the information trust community, credentialing bodies, such as the International Information Systems Security Certification Consortium (ISC)<sup>2</sup>, must continue to enhance professional certifications.

"That way, as the information security industry evolves, the workforce can continue to evolve and bring trust to the global Internet community."

**For more information, contact (ISC)<sup>2</sup> at (508) 875-8400 or visit [www.isc2.org](http://www.isc2.org).**





# TRUST IS THE ULTIMATE FIREWALL

(ISC)<sup>2</sup> – SECURITY THAT TRANSCENDS TECHNOLOGY<sup>SM</sup>

Even organizations with identical security technology can have information systems whose trustworthiness isn't comparable. Skilled, motivated and reliable security architects, designers, implementers, administrators and managers make the difference. Experts whose abilities are coveted, because as holders of CISSP® and SSCP® credentials, they're the trusted constituents of the non-profit consortium of industry leaders known as (ISC)<sup>2</sup><sup>SM</sup>.

(ISC)<sup>2</sup> is a non-profit consortium of industry leaders whose charter is to compile and maintain the most comprehensive Common Body of Knowledge (CBK)<sup>TM</sup>. And from this CBK, develop the industry standards for training and credentialing. Those professionals who earn CISSPs and SSCPs, share the credibility of the internationally recognized Gold Standard<sup>SM</sup> in information security.

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## SECURITY: NEW REALITY CHECK | REAL SOLUTIONS

# REAL SOLUTIONS

## BEST PRACTICES FOR PROTECTING THE ENTERPRISE INSIDE AND OUT

**B**oundaries between “us” and “them,” between “inside” and “outside” are quickly disintegrating as employees, customers, partners and even databases interact across time, space and corporate confines.

The same technologies that enable business also make protecting assets and ensuring continuity of operations a relentless challenge.

To protect the ever-blurry enterprise perimeter, the National Strategy to Secure Cyberspace, released by the U.S. government in February, calls for improvement in, among other things, key Internet protocols and software and hardware components.

Some tips for protecting the enterprise:

### SOLUTION: BUILD SECURITY INTO SOFTWARE DESIGN

Many business leaders think boosting software security should top any security list, and experts point out that software defects or inadequate configurations have contributed to every major attack on the Internet since 1986. Too often the security patches that are supposed to eliminate vulnerability instead wreak havoc on other applications, forcing IT staffers to choose between two evils.

In an analysis of 45 e-business applications, security consulting firm @stake found that almost half the security defects it discovered were preventable; the best-designed apps have just one-quarter as many flaws as the worst-designed. The most secure apps, @stake concluded, carry 80 percent less business-adjusted risk than the least secure.

The only long-term solution to this

problem, for both CIOs and software vendors, is to integrate comprehensive security planning and testing into their application development processes, says Jeff Artis, senior vice president of national solutions at Spherion, which provides managed services and professional services. “They should develop a security lifecycle that matches their development lifecycle,” Artis says. “Application security is much like quality assurance and testing: Good results come from careful planning and rigid adherence to a well-defined process.”

@stake points to the following best practices in design, coding and deployment that differentiate the most secure applications:

- Early design focus on user authentication and authorization;
- Mistrust of user input;
- End-to-end session encryption;
- Safe data handling;
- Elimination of administrator backdoors, misconfigurations and default settings;
- Security quality assurance.

### SOLUTION: PUT YOUR DATA IN A VAULT

“There’ve been millions and millions of dollars spent largely on deploying point products and solutions at the perimeter of the enterprise,” notes Ed Gregory, president of Cyber-Ark, a Dedham, Mass.-based information security ven-

## LESSONS FROM 9/11

These security lessons were learned the hard way, after the devastating terrorist attacks of Sept. 11, 2001:

- **MOVE SERVERS INTO HARDENED DATA CENTERS.** Lower real estate, labor and energy expenses offset technical and regulatory hassles as well as costs of building and running secure structures (estimated at five to 10 times regular old office space in primary cities).
- **BRING RECOVERY SITE PROVISIONING IN-HOUSE.** Service provider price increases and demand for higher service levels are making this more cost-efficient.
- **KEEP LESS DISTANCE BETWEEN OPERATIONAL AND RECOVERY SITES.** Too much site separation hikes costs, hinders recover times.



## NEW SOLUTION

## THE INSPIRATION BEHIND PATENTED VAULTING TECHNOLOGY: EXPERIENCE (AND AN EMBARRASSING MOMENT)

**D**uring Alon Cohen's tenure as the head of the System and Security Department for the Israeli military, a personal electronic letter to his girlfriend found its way into the wrong hands.

Embarrassing, yes; but, more importantly, he knew that despite a massive investment in traditional security wares, holes existed and exposure of sensitive, confidential electronic information occurred. In his role as a civilian security expert he would discover it was a widespread problem.

Incidents like these forced Cohen to turn the traditional perimeter security model upside down and inside out, applying the same vaulting concepts that banks used to protect physical money to information security. In 1999, he co-founded Cyber-Ark and built the industry's first vaulting solutions, offering two highly integrated information security solutions for enterprise networks. Today, the Network Vault and the Inter-Business Vault are deployed in over 50 Global 1000 companies.

## ONE WAY IN-ONE WAY OUT

Instead of only trying to protect the enterprises' perimeter, Cyber-Ark's patented Vaulting Technology creates a safe haven for protecting and sharing sensitive information such as account statements and transaction files with customers and business partners. While complimenting existing perimeter security investments, the Vault is, in fact, highly secure regardless of the quality of the perimeter investment. This approach means important

information and data in the Vault remains protected from security threats and misuse occurring outside the Vault.

By splitting the server interfaces from the storage engine, Cyber-Ark has removed the traditional tradeoff between security and accessibility, creating a single data access channel —only one way in and one way out — protected with many layers of tightly integrated security and performance technologies for maximum protection of data stored inside the vault.

## SOLUTION DEPLOYED IN MINUTES

Sound complex? Not for users, who get a dramatically simplified approach to information security that works with all the familiar applications (Word, PowerPoint, E-mail, Online Banking, etc.) and doesn't require any new training.

Administrators with little or no security experience can deploy the solution in just minutes, and easily audit and manage it without an army of security professionals. With Cyber-Ark, accessibility finally doesn't need to trump security.

For more information on Vaulting Technology, contact Cyber-Ark at [www.cyber-ark.com](http://www.cyber-ark.com).

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dor. "While these are good products in their own right, they're very general-purpose in nature — and despite huge investments, statistics show that 80 percent of all companies surveyed have experienced financial loss due to security breaches. Something fundamental is not working the way it needs to."

Rather than try to protect the entire perimeter of a network, which experts and data suggest is impossible, Gregory's firm seeks to secure one place in the network regardless of its overall security: an electronic vault.

Kris Zupan, CEO/CTO of e-DMZ Security, a provider of co-managed secu-

rity services and reseller of Cyber-Ark's vaulting technology says, "Vaulting technology provides an effective alternative for organizations that have the requirement to securely share data.

"Even in organizations lucky enough to have encrypted email across the enterprise, you're still stuck with the problem of versioning, retention, and delegation of access," Zupan says. "Vaulting technology can allow the data owners to proactively protect and share their data with a minimum of overhead."

Zupan, who spent more than a decade viewing security from the user

side of the equation at a Fortune 500 financial services firm and later at a Fortune 500 chemical manufacturer, says vaulting is an enabling technology specifically designed for "people who do security."

Vault solutions, such as those from Cyber-Ark, DigitalNet and others, can safeguard critical data and applications. Cyber-Ark's offerings, for example, support a wide array of secure ID, tokens, smartcards and digital certificates, and enable organizations to create a secure location in the network where vital information can be protected and shared within an enterprise as



## SECURITY: NEW REALITY CHECK | REAL SOLUTIONS

well as among partners, customers and suppliers.

### SOLUTION: LAYERS OF INTRUSION DETECTION AND PREVENTION

Stopping attacks and preventing intrusions require several layers of defense.

Firewalls make it harder for attackers to gather intelligence on services, specific implementations and possible vulnerabilities. Intrusion detection systems (IDSs) send up alarms when attacks get past firewalls. Most experts agree that these solutions should be used together along with such other tools as antivirus scanners and encryption.

"Most of the damage done by viruses, Trojans and worms in the last two years was entirely a side-effect of

overloading the networks," says Christian Byrnes, vice president and service director for security and risk strategies at Meta Group. "None of the broadly distributed malicious code has carried a destructive payload — that is an extremely important issue. One broadly spread virus with the replication ability of Code Red, NIMDA or SQLK Slammer, but with an intentionally destructive payload, would do very significant economic damage to the United States, as well as the rest of the world. More companies could be destroyed this way than by any previous disaster."

Although they're important lines of defense, antivirus scanners, firewalls and IDSs are reactive solutions. Signa-

*Continued on page 16*

## FIREWALL STRATEGIES

■ **PLAN FOR MORE THAN ONE.** A firewall should be dedicated to filtering one type of traffic, and applications should be sorted into groups according to their security requirements.

■ **CONSIDER INSTALLING FIREWALLS ON INTERNAL SYSTEMS** as well as public servers, to defend against internal misuse.

■ **DON'T OVER-DEPLOY.** Instead, use firewalls in conjunction with other technologies, such as antivirus software and intrusion detection systems.

■ **DISABLE UNUSED SERVICES.**

■ **MONITOR YOUR FIREWALLS REGULARLY,** looking at both inbound and outbound connections.

## COMPANY PROFILE

### HOLISTIC APPROACH TO MANAGING SECURITY ACROSS THE ENTIRE ENVIRONMENT

**C**omputer Associates (CA) understands that today's organizations need to be in complete command of their enterprise security. CA's eTrust™ security solutions holistically address all aspects of business security, enabling an enterprise to quickly and effectively embrace new opportunities, improve operational efficiencies, reduce costs, and proactively manage virtually all security threats and risks to the organization.

CA's eTrust solutions are grouped into three areas: eTrust™ Identity Management; eTrust™ Access Management; and eTrust™ Threat Management; each of these can be consistently and visually managed through eTrust™ Security Command Center.

**eTrust Identity Management** solutions centralize and automate the creation of user accounts and approval workflows, provisioning both IT and non-IT resources while reducing costs through process automation. It also increases user productivity through integrated single sign-on and self-service, including password resets. Supported by strong authentication and a scalable identity repository, CA's eTrust Identity Management solutions manage every aspect of the business identity.

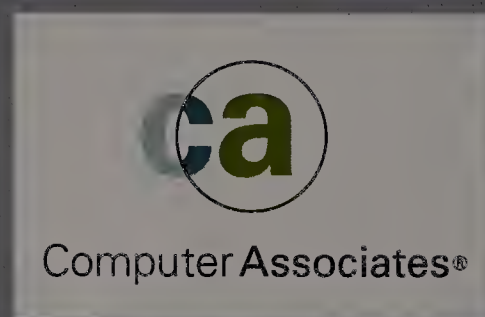
**eTrust Access Management** solutions secure critical business assets by centralizing and strengthening security, regardless of operating system, platform or business application and whether or not resources are web-based. This technology also offers the strongest possible protection

through active dynamic security — preventing both internal breaches and external security attacks while monitoring violations across all access devices. Through the consistent application of access policies, organizations can deliver productivity-enhancing personalization while reducing management costs.

**eTrust Threat Management** solutions detect, analyze, warn, prevent and cure attacks, across the environment. Through active and adaptable risk mitigation, threats are immediately isolated through multiple detection techniques, its spread is contained and lastly extinguished. CA's eTrust Threat Management solutions empower organizations to adapt their security defenses to new situations without increasing operational overhead or costs.

**eTrust Security Command Center** reduces, aggregates, correlates and prioritizes disparate security data across the enterprise by converting it into intelligent, actionable information that can be managed from a single, centralized location. eTrust Security Command Center's "See it All, Manage it All" solution allows you to gain full security command-and-control.

With a holistic approach to managing security across the entire environment, CA's eTrust security solutions provide the power to secure.



For more information, contact (631) 342-6000 or visit [www.ca.com](http://www.ca.com).





Can your antivirus software provide double the scanning power? Ours can

Making sure your company is secure gets more and more difficult every day. That's why eTrust™ Antivirus v7 from Computer Associates uses dual scanning engines to ensure comprehensive virus protection. It processes data in real time to search out and eliminate viruses, and it also scans files during prescheduled and off-peak hours. All at the cost of most single-engine AV products. It's more than just twice the protection. It's twice the peace of mind.

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## SECURITY: NEW REALITY CHECK | REAL SOLUTIONS

ture-based IDSs, for example, will spot only the attacks they've been programmed to recognize, leaving a "window of opportunity" between time-of-attack and release of patches. Some thoughts on these solutions:

**Application firewalls.** Designed to protect specific services from attack, an application firewall uses definitions of acceptable input to recognize and halt abnormal protocol sessions before they reach the application itself. Thus application firewalls can eliminate entire classes of vulnerabilities, such as format string attacks or buffer overflow attacks.

**Beyond detection: preventing intrusions.** By inspecting system calls against behavioral rules, intrusion prevention solutions such as those from Watchguard, Cylant and SecureWave can catch all manner of bad stuff, including illegitimate system calls, registry changes, and such malware as Trojan horses, backdoors, rootkits, worms. System administrators can control with some delicacy the rules by which intrusion prevention solutions judge application behavior, imposing limitations by application, class of user, platform and so on.

**Gateway IDS: firewalls and IDS converge.** Integrating multiple methods of intrusion detection (signatures, protocol and traffic anomalies) with firewall features, gateway IDSs — like those from Internet Security Systems (ISS), Top Layer Networks and NetScreen — operate in the data path so they can respond to attacks by actively dropping packets. ISS's RealSecure Guard analyzes traffic in real time and blocks attacks, creating a virtual TCP/IP stack to reassemble packets and decide if the traffic should be permitted or blocked. Top Layer Networks' ASIC-based Attack Mitigator has been preconfigured to identify HTTP URI exploits, denial of service attacks, Trojan horses and other hybrid threats using advanced "normalized" deep packet and multipacket HTTP URI matching and wildcard checking.

**Trusted operation systems.** For mission-critical servers that don't change a lot, you can use trusted OSs, industrial-strength tools that protect the entire operating environment. Trusted OSs compartmentalize resources (processes, ports, network interfaces, files), enforce mandatory access control and employ least-privilege user restrictions. Trusted OSs cost more and take longer to configure correctly, but offer strong security for host systems. To standard trusted OS functions Computer Associates' eTrust Access Control adds central management and policy sharing across systems, centralized auditing for all systems and synchronization with mainframe authentication. Nokia's IPSO is an appliance-optimized, clusterable OS that's used as the secure OS for firewalls, VPNs and intrusion protection systems. It also supports operator-to-operator roaming border gateway applications and is put to work within mobile GSM, GPRS and 3G networks to route and control mobile data.

## THE INS & OUTS OF OUTSOURCING SECURITY

When should an organization consider seeking outside help to ensure its information security? Here are the most common recommendations:

**AUDITS:** To reduce the dangers of security flaws in software, says Chad Robinson, senior research analyst at the Robert Frances Group, "IT executives should arrange for regular audits of internally developed code by both automated vulnerability assessment tools and trained security professionals."

Outside experts can keep your security solutions up to date, too. John Stehman, principal analyst at the Robert Frances Group, advises getting experts to annually "check-point the existing solution against best of breed and make sure it is still effective against prevalent types of attacks."

**VULNERABILITY ASSESSMENTS:** Most CIOs and CSOs recognize that periodic security reviews have become an operational necessity, says Jeff Artis, senior vice president of national solutions at Spherion's technology services division. "Even though the internal IT department may do an outstanding job, an independent review from an outside expert provides several important benefits," Artis says. In addition

to finding exposures that your team might not be aware of, an objective examination can provide new perspectives on vulnerability and risk, make recommendations for continuous improvement or simply verify an expected level of protection.

**COST REDUCTION:** Managed security services can save midsize companies as much as 80 percent of in-house security costs.

As for criteria for selecting a managed security services provider, consider these tips:

- Make sure the provider is well-funded. That means at least several million dollars of capital available. And check the provider's plans for tough times.
- Take a close look at the provider's security operations centers. When doing your own due diligence, insist on bringing along a specialist who can assess the provider's technology and processes.
- Check out the provider's policies and procedures.
- Ensure that provider can handle your business. Even if data volumes double or triple.
- Find out how the provider's current clients regard support services. Were issues resolved promptly, satisfactorily?



## NEW SOLUTION

## A CO-MANAGED SOLUTION FOR SECURITY AND CONTROL

**I**n today's dynamic environment, security needs to be managed constantly and consistently," notes Kris Zupan, CEO/CTO of e-DMZ security. "Changing threats require more specialized expertise than ever before, but, unfortunately many organizations lack an adequate supply of qualified security professionals."

Moreover, turning to traditional managed security solutions may no longer be an optimum choice, says Zupan, because "they take away too much control, while legislation like HIPAA demands companies to be in control like never before."

The solution, he explains, can be found in Co-Managed Security Services (CSS), which adds a well-established security team to an organization's existing arsenal of defensive capabilities. Unlike traditional Managed Security service clients, CSS users retain administrative privilege on all devices, have real-time access to all changes made on their behalf and dictate change control.

## FEWER PEOPLE, LESS TIME, FRACTION OF THE COST

"No security expert knows your company's challenges and environment better than the people who are currently supporting it," says Zupan. "With co-managed security services, you can add experience, expertise, and energy without changing policy or standards. It delivers a mature operational model with years of automation and enterprise experience, while enabling an organiza-

tion to manage its security infrastructure the way it wants ... with fewer people, in less time, and at a fraction of the cost," he adds.

It also delivers the freedom to be productive, according to an IT executive at a Fortune 500 Pharmaceutical company currently using e-DMZ's CSS offering, who says it has given "our engineers the freedom to move forward with planning and architecture concerns for our perimeter security systems without having the worry of ensuring that day-to-day responsibilities are completed."

e-DMZ Security's experience supporting highly regulated industries is reflected in its own CSS methodology and services. All of e-DMZ's processes include dual control mechanisms and optimize availability as well as strong, auditable processes and the commitment to never pass an unencrypted packet. e-DMZ's list of services includes co-managed firewall service, co-managed intrusion detection services, co-managed Unix security, and ESMS+, a unique highly automated security solution ideal for small to mid-size organizations.

For more on co-managed security, visit [www.e-dmzsecurity.com](http://www.e-dmzsecurity.com).



**Your Information Security Ally™**

Web server shields. For environments where trusted OSs are too intrusive, Web server shields such as those from Enterscept Security Technologies, Watchguard Technologies and eEye Digital Security offer more flexibility by enabling control over Web servers to be customized. eEye Digital Security's SecureIIS protects against such Web server attacks as buffer overflows, directory traversals and parser evasions.

## SOLUTION: BRING IT ALL TOGETHER

A number of vendors have begun combining key information security solutions into single appliances of many varieties, making it easier for organiza-

tions large and small to field centralized but flexible platforms that can handle multiple security requirements.

For instance, Ingrian Networks' offers an integrated security platform that encompasses authentication, encryption, cryptographic key management, real-time application protection, secure storage and audit functions.

Nokia's enterprise-oriented IP530 — which is integrated with Check Point's VPN-1/FireWall-1 software — delivers VPN, firewall and intrusion detection capabilities. And Internet Security Systems (ISS) has teamed with Nokia to turn out RealSecure, an IDS

appliance built on Nokia firewall resources.

FTI, which offers financial restructuring, litigation support and engineering/scientific investigation services, needed to link all offices to its intranet and set up "war rooms" for clients on a separate, secure extranet. The solution replaced a frame relay network with a Check Point virtual private network (VPN) and Nokia's network security appliances. FTI runs the new network, including client war room sites, for 60 percent less than the cost of a frame relay design, enabling the firm to see ROI within a year.

"Many corporate security initia-



## SECURITY: NEW REALITY CHECK | REAL SOLUTIONS

tives include the implementation of intrusion detection systems throughout the network," says Dan MacDonald, vice president for product management, at Nokia Internet Communications. "While implementing IDS systems in remote offices is critical to achieving robust security, traditional approaches are not feasible due to complex integration and virtually no remote management capabilities."

### SOLUTION: IDENTITY MANAGEMENT/SINGLE SIGN-ON

Multiplicity is doing a number on the ability of organizations to manage how

users are granted access to information and applications. User information resides in too many locations (databases, directories, operating systems) and gets managed by too many different utilities (portals, access management tools, platform-specific admin tools, password management tools).

Technologies that enable IT staff to centrally manage user accounts and access rights across diverse IT environments and platforms offer impressive ROI. Gartner Group reports three-year payback at triple-digit-percent levels, achieved chiefly by staff reductions in helpdesk, security administra-

tion and application development functions.

Computer Associates' eTrust Identity Management solutions, for instance, integrates single sign-on with a variety of techniques — including PKI, biometrics and hardware tokens — into a user management process that spans applications and environments, cuts costs via Web-based self-administration, and stays flexible because of an extensible identity directory.

The payback can be significant. A study conducted by Gartner and sponsored by Ernst & Young LLP,

# EMERGING TECHNOLOGIES, EMERGING RISKS

The rapid growth of electronic business processes and the technology to support them has introduced a new level of complexity to managing security enterprisewide, says Brian Bilodeau, vice president for data movement solutions at Sterling Commerce. "Not only do processes span business units within an organization," he says, "but they also extend outside to include customers, suppliers, financial institutions, business partners, governmental and regulatory agencies, and other constituencies."

That's not all. Extended business processes involve sharing of data among the participating constituencies and software applications that implement elements of a business process, Bilodeau notes. Implementing an electronic business process requires CIOs to build an infrastructure that enables the automated movement of data while addressing all the requirements for securing data.

Bilodeau points to the use of FTP for ad hoc transfer of business data. Even when users encrypt the data before transferring, the use of FTP creates a high security risk because security information, such as user IDs and passwords, is often stored and transmitted in clear text. "CIOs and CSOs must look for ways to secure the use of FTP within their enterprise," Bilodeau says.

Here are some suggestions for securing some of the popular new technologies:

### SECURE DATA EXCHANGE

A range of options, from classic electronic data interchange (EDI) to Internet-based data interchange with or without

added capabilities (such as project management) are available from providers like Global eXchange Services, Inovis, Sterling Commerce and QRS Corp.

Sterling Commerce's Connect:Direct offerings, for instance, feature assured data delivery, checkpoint/restart, cryptographic suite for authentication, encryption and data integrity, firewall navigation and data compression.

Others, such as Sigaba, offer secure messaging solutions with configurable policies that permit administrators to determine which messages are encrypted, archived or flagged for further review.

### CONTROL I.M. OR EXTERMINATE IT

The immense popularity of instant messaging and other peer-to-peer technologies puts pressure on IT staff to do something about the security challenges they pose. By 2006, says IDC, almost half of the 506 million IM users will be in businesses. Yet widely used IM freeware (from AOL, Microsoft, Yahoo) is virtually unsecured. They transmit data in the clear; they bypass firewalls, antivirus scanners and intrusion detection systems. You can try to keep IM use in-house (good luck). Network intrusion detection systems can be used to monitor all traffic traversing a firewall and spot known IM traffic patterns. Network recording systems, such as those from Sandstorm or Niksun, can also do the trick.

Or insist that an enterprise-oriented IM solution — such as IBM's Lotus Sametime or Sigaba's Secure IM — be used. These build encryption, authentication and LDAP integration into the IM solution.



Microsoft, Netegrity and Protiviti concluded that a business of 10,000 employees deploying an automated provisioning solution could see an ROI approaching 300 percent and savings of \$3.5 million in three years. A business with 50,000 employees implementing an extranet access management solution can expect an ROI of 375 percent in three years.

Real-world results are impressive, too. A survey of 145 U.S. companies by Nervewire found that 38 percent anticipate a fivefold return on their identity management solution investments, thanks mostly to achieving improved customer service, which produces higher customer satisfaction and better customer retention.

### SOLUTION: THREAT MANAGEMENT SYSTEMS.

"Many organizations of all sizes have been overwhelmed with security management and the difficulties in protecting themselves across the extended enterprise in a cost-effective manner," says Tom Noonan, chairman, president and CEO of Internet Security Systems (ISS).

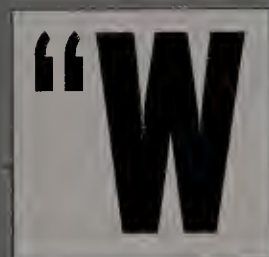
"The best approach to security enables organizations to proactively protect against potential security risks when vulnerabilities are first discovered and before threats can become active attacks," says Noonan. "The result is more effective resource planning and timely response to both known and unanticipated threats with minimal impact on production systems or daily business operations."

All the events reported by all security systems have been gathered and distilled manually for some time. But the volume and complexity of security data makes such manual event correlation impossibly costly.

Security information management systems work in the background 24/7

### CASE STUDY

## MAGNET COMMUNICATIONS BANKS ON SECURE+



we put a tremendous emphasis on security, as do our client banks," says David E. McCampbell, senior vice president and CTO at Magnet Communications, a provider of Web-based cash management and business banking solutions to the nation's top-performing financial institutions.

Not surprisingly, security was a critical element McCampbell and his team used to evaluate the software it needed to support Magnet's ASP business. After an in-depth review, reports McCampbell, Magnet chose Sterling Commerce's Connect:Direct (a peer-to-peer file-based integration software solution) and Connect:Direct's highly versatile Secure+ Option for data confidentiality, message integrity, server authentication and client authentication.

### BEYOND A SHADOW OF A DOUBT

"Secure+ is a key component of Connect:Direct for us and for many of our client banks," says McCampbell. "With Secure+, we know — and our client banks know — that data is in the most secure fashion when it's being transferred by Internet or over frame relay."

According to McCampbell, Secure+ provides "plenty of mutual authentication" by making use of such technologies as digital signatures and SSL for data encryption.

"So, if I'm sending data, you know and I know that you and I are talking to each other; in other words, I know you're the only one seeing it," he explains.

Moreover, he says, Secure+'s use of industry accepted hashing algorithms make it impossible to tamper with the data as it's being transmitted.

"This is critical financial information being



**David E. McCampbell**  
Senior vice president and CTO  
Magnet Communications

transmitted between Magnet and our client banks — multimillion-dollar wire transfers, stop payments, balance information, payroll and tax information — and we must be able to ensure beyond a shadow of a doubt that no tampering has occurred during the transmission and transfer of the data. Secure+ gives us that confidence."

Magnet, which has been using the Connect:Direct and Secure+ combination since 2000, is extremely pleased with the performance of Sterling Commerce's products.

"We've seen no degradation in service; it just hasn't been an issue. Performance has been great, very efficient, very reliable and there hasn't been much in the way of on-going maintenance," he says.

McCampbell, however, saves his greatest praise for Sterling Commerce's support.

"They excel at training, act like a partner not a vendor, and take responsibility for quickly addressing any issues that arise — you can't ask for much more," he says.

For more information, contact Sterling Commerce at  
[www.sterlingcommerce.com](http://www.sterlingcommerce.com).



**SECURITY: NEW REALITY CHECK | REAL SOLUTIONS**

doing dynamic risk correlation — consolidating all security data and translating inputs into a homogenous set of events that are analyzed with an assortment of techniques to identify threat conditions. Because these automated systems can handle many inputs, defense in depth and breadth is feasible. And because IT staff get results in real time, threat intervention can be timely and effective. Furthermore, the comparative metrics generated enable early detection of changing conditions and patterns.

ISS's RealSecure SiteProtector, for instance, combines intrusion detection, prevention and response as well as vulnerability assessment, policy compliance, and data collection and analysis — all of which is accessible via a centralized, policy-based management console.

**SOLUTION: INTEGRATED SECURITY MANAGEMENT**

The complex heterogeneous network and application environments that are necessary for empowering e-business have spawned equally intricate security and management processes. Implementing security policies across such environments while maintaining an appropriate balance between business performance and risk mitigation is proving difficult. Moreover, in too many organizations, managing user access rights means juggling multiple directories, user lists, password lists, application access lists and password reset activities.

"CIOs and CSOs are suffering from security information management overload," says Toby Weiss, senior vice president for eTrust Security Solutions at Computer Associates. "Millions of messages from firewalls, VPNs, antivirus products, access control products, directories, etc., cause them to suffer from a signal-to-noise problem." **SD**

# THE VALUE OF PRIVACY

## WHILE PROTECTING YOUR ASSETS, BE SURE TO RESPECT YOUR CUSTOMERS' PRIVACY, TOO

Stories abound of organizations tempted by all that customer information into violating their customers' trust — even if they figure out ways around corporate privacy policy. The stories generally end badly for the organizations, leading to the conclusion that not respecting customer preferences about how their information is used too often turns into a costly mistake.

Similarly, not protecting that information sufficiently can also be costly.

Customer fears about privacy are starting to shape their purchasing decisions. IBM found in a recent study that 54 percent of U.S. consumers have chosen not to buy something from a company because they were unsure about how their personal information would be used, and 70 percent want to see a website's privacy notice before buying.

"To maintain a positive reputation and trust between organization and customers, enterprises must make privacy a top priority," says Jim Dunn, network manager at Citywide Banks in Aurora, Colo.

"CIOs, CSOs, and their companies should think of their customers first, before any legal responsibility," Dunn says. "This should be first and foremost for any company that respects their customers and wants to foster trusted long-term relationships with them."

Dunn notes that SEC and regulations such as HIPAA for health-care organizations and the Gramm-Leach-Bliley (GLB) Act in the financial services sector mandate that effective privacy measures be put in place, and companies are being audited on their compliance — with stiff penalties being imposed for failure to comply.

Cultivating trust begins with an information privacy policy that respects customer preferences. Some considerations:

Opt-out defaults indicate greater concern for customer wishes than more aggressive opt-in defaults that assume customers grant permission for further contact (the consolation: when customers choose to opt in, they're likelier to respond to contact).

Frequent communication with customers helps ensure that information-use practices remain acceptable.

Regular audits make it easier to track what data is being gathered, how it's used, and how it's secured.

Dunn suggests using a combination of policy and technology. For example, each document can be sent with a notice that the recipient is responsible for maintaining the privacy and confidentiality of the message. The administrator can also set a policy that the message cannot be stored in decrypted form, thus reducing the possibility that an unauthorized recipient could gain access. In addition, if a key server is being used in secure document delivery, the key can be set to expire after a given period of time.



## SECURITY SOLUTIONS CENTER



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**SECURITY: NEW REALITY CHECK | THE SECURITY STRATEGY IMPERATIVE**

*Continued from page 6*

Internet Security Systems, Computer Associates, and Foundstone.

**CREATING A SECURITY POLICY**

You'll need operational policies that are customized to your organization's business requirements, so you'll have a set of rules-based standards for managing infrastructure and handling events.

Such policies should delve into some detail and include rules about such issues as which services to disable, which operating systems (OSs) to harden and which systems the network can access.

Make sure you know that policies are being followed. Assessment tools,

such as Internet Security System's Scanner offerings, can help spot problems and send alerts. Computer Associates' eTrust Policy Compliance monitors systems and databases, and provides auditing and correction of security breaches.

stantly review the policy and audit, and assess its enforcement." Most companies have a corporate policy document, but the challenge is how to turn that document into IT security policy, automatically enforce and audit that policy, and loop back and improve the policy.

## **ANCIENT MILITARY WISDOM CAN BE GRIMLY SIMPLE: SEVERAL TIERS OF DEFENSE ARE BETTER THAN ONE.**

"My advice," says Toby Weiss, senior vice president for eTrust security solutions at Computer Associates, "is to build off of best practices, con-

Ancient military wisdom can be grimly simple: Several tiers of defense are better than one.

This means planning not only for

# **BUSINESS CONTINUITY: THE DARK SIDE OF SECURITY PLANNING**

Of the more than \$40 billion that insurance companies paid out because of the September 11 attacks, more than 25 percent — \$11 billion — was for claims relating to business interruption.

Some industry experts say that among organizations that suffer significant, sustained disasters, 20 percent are completely out of business within 24 months.

Yet many companies simply don't have disaster recovery/business continuity plans. Many of those who do have allowed them to become out of date. Still other plans have dangerously ignored key human factors.

To ensure your organization's survivability, you'll need a business continuity plan that is:

- Based on the best possible understanding of the survivability risks faced by your organization. This includes reviewing assumptions about the risks your enterprise faces, and don't forget about partners, suppliers, cus-

tomers. Since organizations' security requirements are unique, Robert Francis Group recommends that CIOs and CSOs develop business application profiles that define security requirements for each application or area, including database, file, e-mail and Web servers.

- Up to date and comprehensive, identifying and tackling all potential points of failure.

- Addressing technology issues in terms of business operations. These include rapid restoration of operations, critical technologies and personnel.

- Developed with the input and support of line-of-business managers and key constituencies, since the plan will be expected to work across the organization, not just among IT staffers.

- Tested and refined — and then regularly re-tested and re-refined thereafter, especially with every substantive change in infrastructure and processes. Expect to modify vendor relationships along the way.



## SECURITY: NEW REALITY CHECK | THE SECURITY STRATEGY IMPERATIVE

multiple layers of carefully positioned and configured security technology solutions at both the host and network level — such as firewall, intrusion detection systems and antivirus software — it also means layering authentication procedures; continuously monitoring and patching systems networks and applications; and handling people (paying attention to the discontented, for instance).

### PROTECTING YOUR ASSETS

“Face it,” says MIT’s Foss, “people write software programs and people make mistakes. There will always be security issues in software.”

The question, then, is how to keep them from doing harm.

Meta Group’s Byrnes has these suggestions:

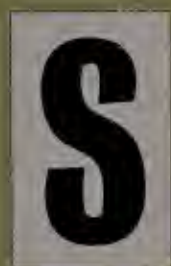
- **BUILD DESIGN STANDARDS** for various identified security level requirements. Development teams should self-certify against the design standards for that level.
- **APPLICATION DEVELOPMENT TEAMS SHOULD USE DEFINED METHODS** for gathering security-level information from application owners in the business units.
- **EITHER THE INFORMATION SECURITY DEPARTMENT OR INTERNAL AUDIT SHOULD SPOT CHECK** for compliance.
- **PRE-PRODUCTION Q.A. TESTING SHOULD INCLUDE COMMON SECURITY FAILURE TEST.**

The bottom line of security strategy: Think ahead.

“Don’t just think about what you need today,” suggests Jim Dunn, network manager of Citywide Banks in Aurora, Colo. “Think about what you’ll need years down the road as you grow and become more sophisticated, so that you can leverage your existing investments and scale them broadly and for many more uses.” **SD**

### COMPANY PROFILE

## DYNAMIC THREAT PROTECTION™: A NEW DEFINITION FOR INFORMATION SECURITY



Security is hard. It requires tremendous technical expertise, is expensive to do well and is rarely part of an organization’s core business model. In addition, the online threat spectrum continues to evolve with sophisticated hybrid attacks that can circumvent firewalls and antivirus technology.

No one doubts the need for secure online business operations. The challenge is how to do so efficiently and effectively. That’s where the Dynamic Threat Protection approach provides a clear advantage over other security methods.

### TO PROACTIVELY PROTECT AND SECURE

The Dynamic Threat Protection approach is the natural evolution of Internet Security Systems’ (ISS) market-leading vulnerability assessment, intrusion detection and security knowledge offerings. After all, effective protection requires the best analysis, detection and response possible.

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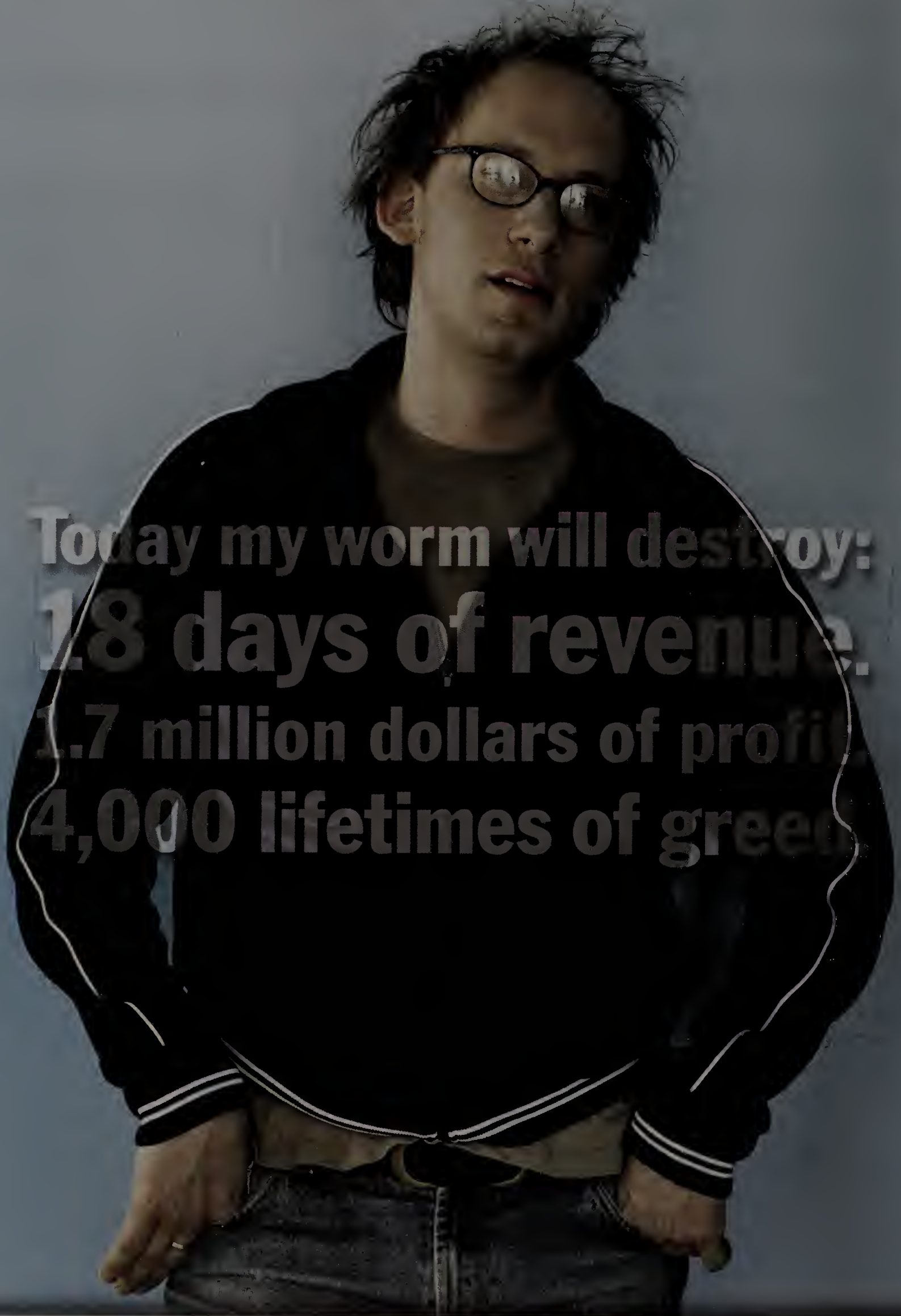
ISS and its partners, products and services based on the Dynamic Threat Protection approach give security staff the ability to quickly concentrate efforts on the most urgent issues. The end result is more effective resource planning and timely response to both known and unanticipated threats with minimal impact on production systems or daily business operations.

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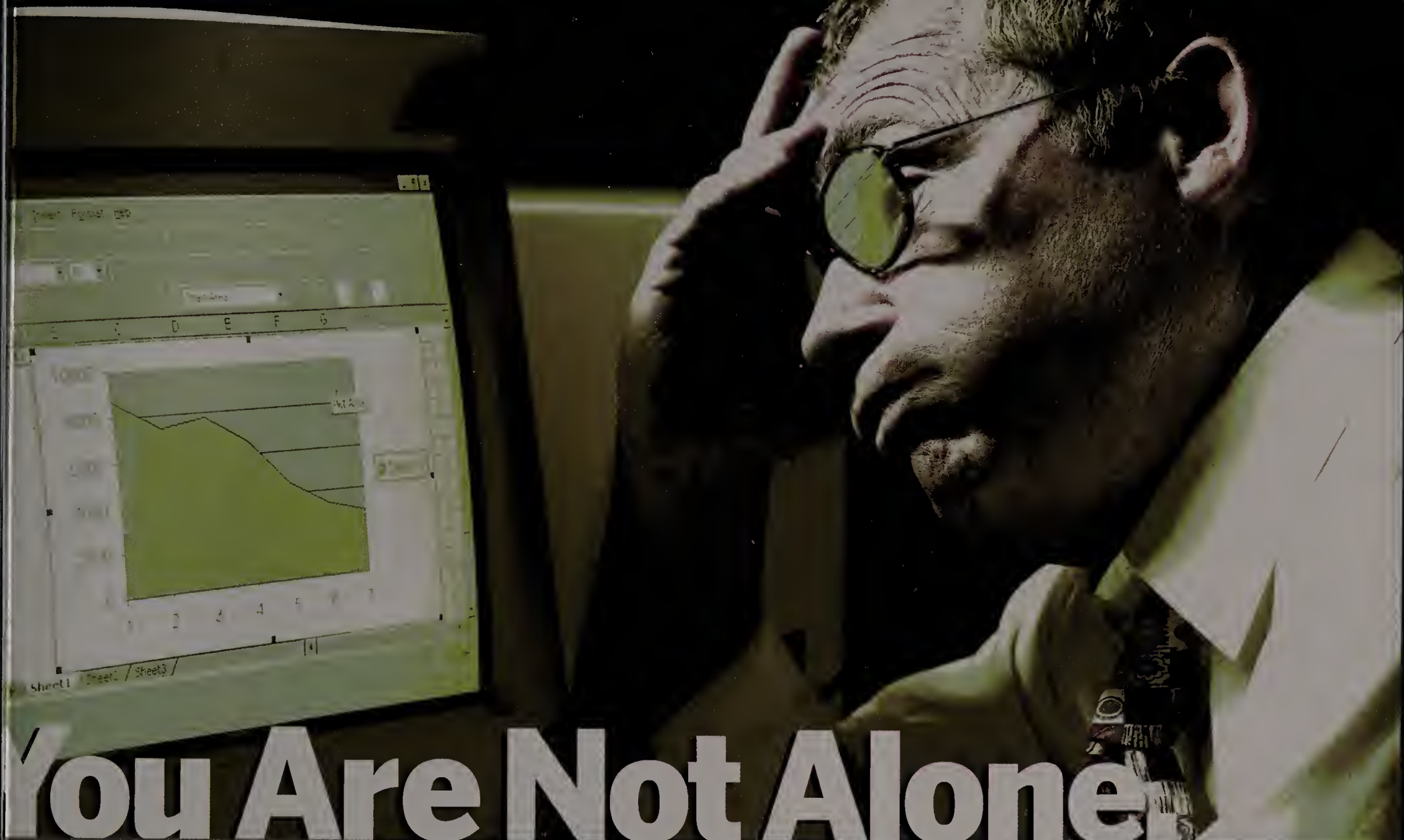
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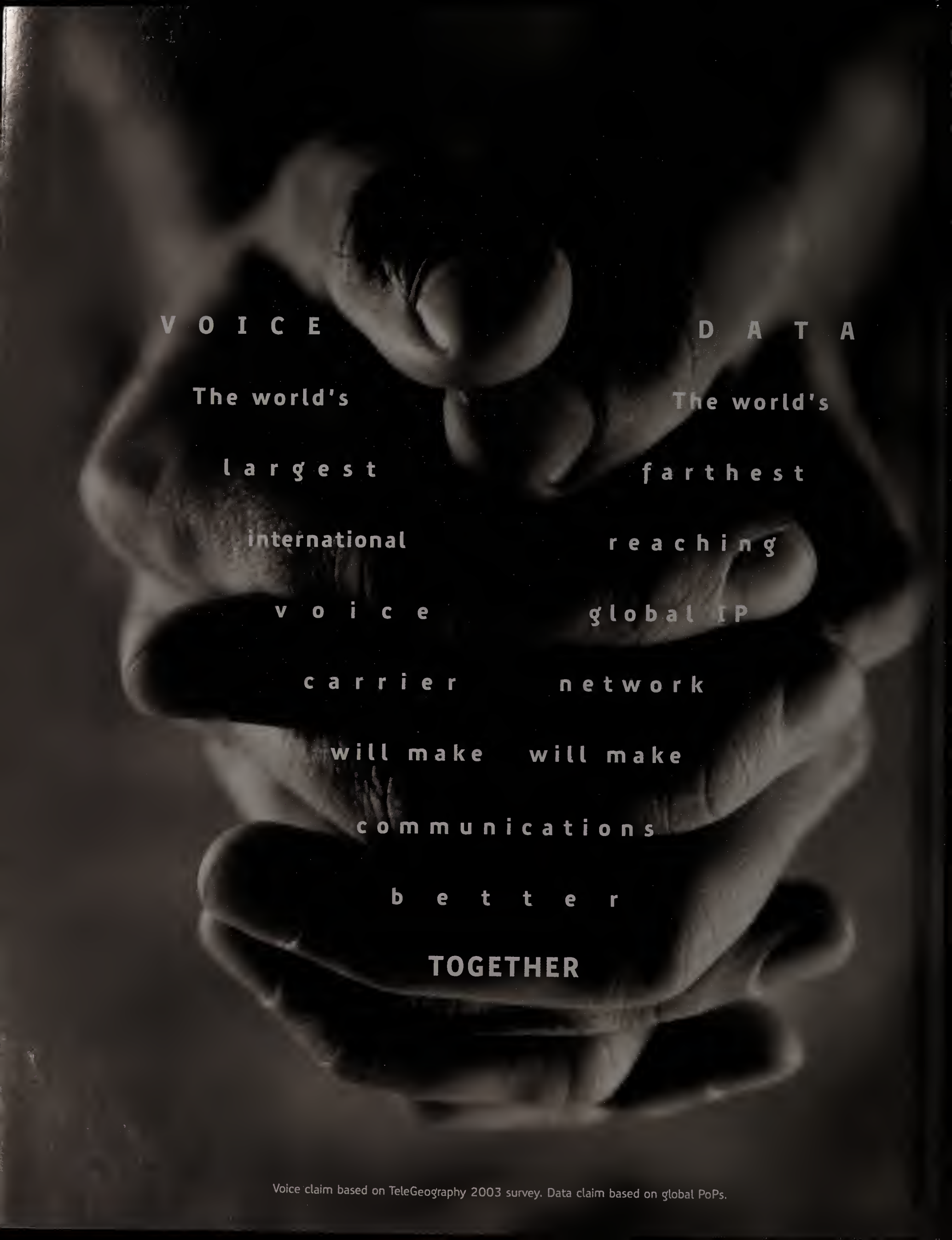
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*Portfolio management is a tool providing clear benefits, among them a holistic view of IT projects across the enterprise and the alignment of IT with corporate strategy. But it isn't easy. We've found some portfolio masters willing to share their secrets.* BY TODD DATZ

# PORTFOLIO MANAGEMENT How to Do It Right

**Ron Kifer, vice president of program management at DHL Americas, is a veteran of the typical project**

**and portfolio planning—or lack of planning—process in many companies.** “The last three organizations I’ve been in had the same scenario. They didn’t have defined processes for reviewing project proposals; projects were pretty much recommended by senior vice presidents in each business area,” he says. “They were attempting to do many more projects than they had the capacity to do. Bad projects squeezed out good projects. There was no visibility of what was being done throughout the organization.”

That’s a recipe for disaster. At a time when CEOs are demanding that technology investments return value, CIOs who don’t have control

#### Reader ROI

- ▶ Why portfolio management is a key tool for CIOs now
- ▶ Tips from leading practitioners on how to do it
- ▶ The payoffs and challenges of doing it right

PHOTO BY STEVE CRAFT

A full-page photograph of a man, Ron Kifer, standing in an office. He is wearing a white long-sleeved shirt, a patterned tie, and dark trousers. He has a beard and is looking directly at the camera with his arms crossed. The background is a blurred office environment with desks, computers, and other people working.

**Ron Kifer, VP of program management at DHL Americas, says one of his first tasks in gaining control of IT portfolio activities was to create a project inventory and put it into a master schedule.**



over their IT project portfolios are fighting losing battles. Surprisingly, that's a good number of you: A recent report by AMR Research contends that as many as 75 percent of IT organizations have little oversight over their project portfolios and employ non-repeatable, chaotic planning processes.

But if you're not doing it already, portfolio management can help you gain control of your IT projects and deliver meaningful value to the business. Portfolio management takes a holistic view of a company's overall IT strategy. Both IT and business leaders vet project proposals by matching them with the company's strategic objectives. The IT portfolio is managed like a financial portfolio; riskier strategic investments (high-growth stocks) are balanced with more conservative investments (cash funds), and the mix is constantly monitored to assess which projects are on track, which need help and which should be shut down.

But it's all in the execution. Jeff Chasney, executive vice president of strategic planning and CIO at CKE Restaurants, notes that "some companies do it poorly and some do it well." The companies profiled in this story reveal their best practices for doing it well.

## Why You Need Portfolio Management

Think about how IT investments are managed in your company; do any of the following scenarios ring true? Million-dollar projects, which may or may not match the company's objectives, are awarded to business units headed by the squeakiest executives; weak IT governance structures mean that business executives don't have clear ideas of what they're approving and why; the CIO ends up selling projects that should be generated and sold by line-of-business heads; the company doesn't build good business cases for IT projects or it doesn't do them at all; and there are redundant projects.

A strong portfolio management program can turn all that around and do the following:

- Maximize value of IT investments while minimizing the risk
- Improve communication and align-

# Powerful Portfolios

Good portfolio management requires both a 30,000-foot view and a picture from ground level

Figure 1

## The High-Level View—The Portfolio Pyramid

The IT portfolio at the highest level can be categorized into several investment classes. In the MIT model, the portfolio pyramid rests on a base of infrastructure investments. The next layer is transactional systems, which depend on a reliable infrastructure. At the pinnacle are information-producing technologies and strategic-class systems.

## The Four Asset Classes—Risk Versus Reward



### INFRASTRUCTURE

These investments provide a shared and standardized base of capability for the enterprise and lead to greater business flexibility and integration. Infrastructure investments are moderately risky because of their technologies' long life-spans and technical uncertainty.



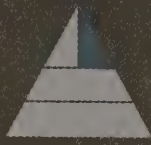
### TRANSACTIONAL

These IT initiatives process and automate the basic transactions of a company. They are intended to reduce costs and boost productivity and boast an average internal rate of return of 25 percent to 40 percent. These investments have the least risk of the four classes.



### INFORMATIONAL

These systems provide information for managing a company. Their payoff comes from shorter time-to-market, superior quality and the ability to set premium prices. They are moderately risky because companies often have difficulty acting on information to generate business value.



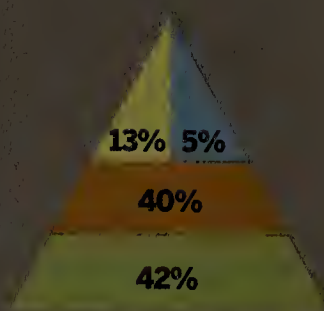
### STRATEGIC

These investments, almost always external-facing systems, pay off in sales growth, competitive advantage and stronger market positioning. But they are the riskiest of the classes: 10 percent will produce spectacular results, but 50 percent will fail to break even.

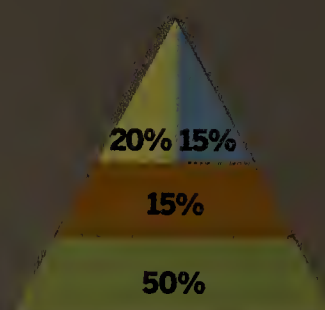
## Three Custom Portfolios

Company IT portfolios in the MIT study sample show different proportions of total IT investment in the four classes, depending on whether their strategic focus is cost-control, agility or a balance of the two.

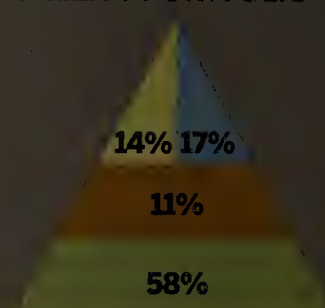
### COST-FOCUSED PORTFOLIO



### AGILITY PORTFOLIO



### BALANCE COST & AGILITY PORTFOLIO



SOURCE: M.I.T. SLOAN CENTER FOR INFORMATION SYSTEMS RESEARCH



Companies must visualize their IT portfolios on multiple levels and at different stages for a true and thorough perspective of their IT investments. To gain the holistic view necessary for portfolio management, investments should be viewed in aggregate and placed into categories, with the percent of IT spend apportioned across each. Figure 1 depicts one such model, developed by Peter Weill, director of MIT's Sloan Center for Information Systems Research,

and Marianne Broadbent, group vice president and head of research for Gartner's executive programs worldwide, that is based on an ongoing study of 54 companies in seven countries. This model provides an executive-level analysis of the enterprise-wide IT investment and its alignment with the general strategy of the business.

Figure 2 shows a ground-level view of how one company monitors every aspect of its portfolio, from the initial business case to

spending updates. Brigham Young University (BYU) has developed this tool to allow business and IT leaders to monitor projects and facilitate the university's ongoing portfolio management.

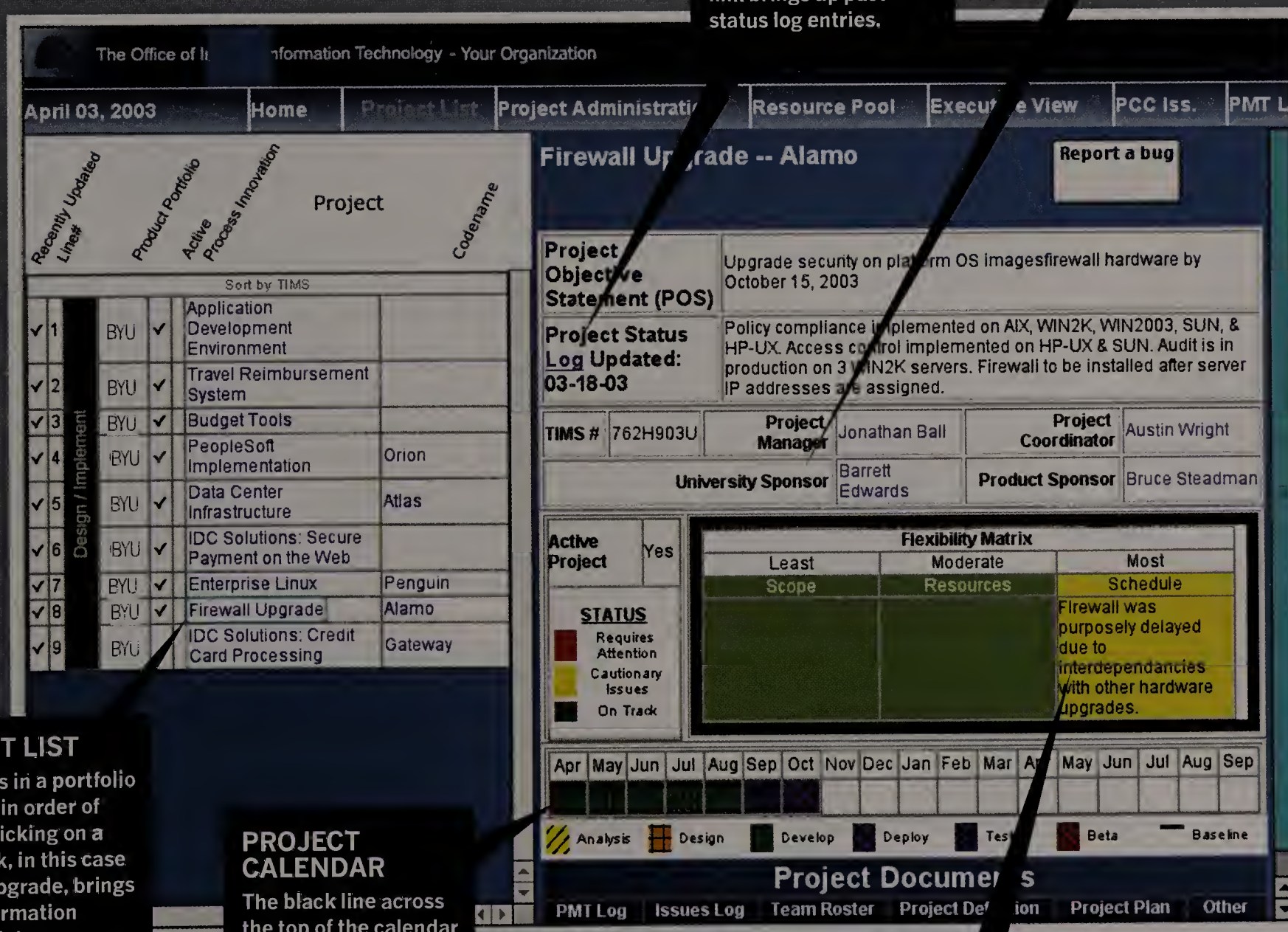
The Weill model and the BYU tool are only two examples of the many ways to look at IT portfolios and projects. But they illustrate the range of views that are essential components of a complete and effective portfolio management process.

Figure 2

## A Ground-Level View—The Portfolio Dashboard

Brigham Young University developed a Web-based tool that allows managers to see a list of projects prioritized by portfolio category at a glance. Project details are just one click away, allowing business and IT leaders to monitor the ongoing status of projects.

SOURCE: BRIGHAM YOUNG UNIVERSITY



### PROJECT LIST

All projects in a portfolio are shown in order of priority. Clicking on a project link, in this case Firewall Upgrade, brings up the information shown at right.

### PROJECT CALENDAR

The black line across the top of the calendar (April through Aug.) was the original schedule; this project will take an additional two months to deploy.

### PROJECT STATUS

Clicking on the "Log" link brings up past status log entries.

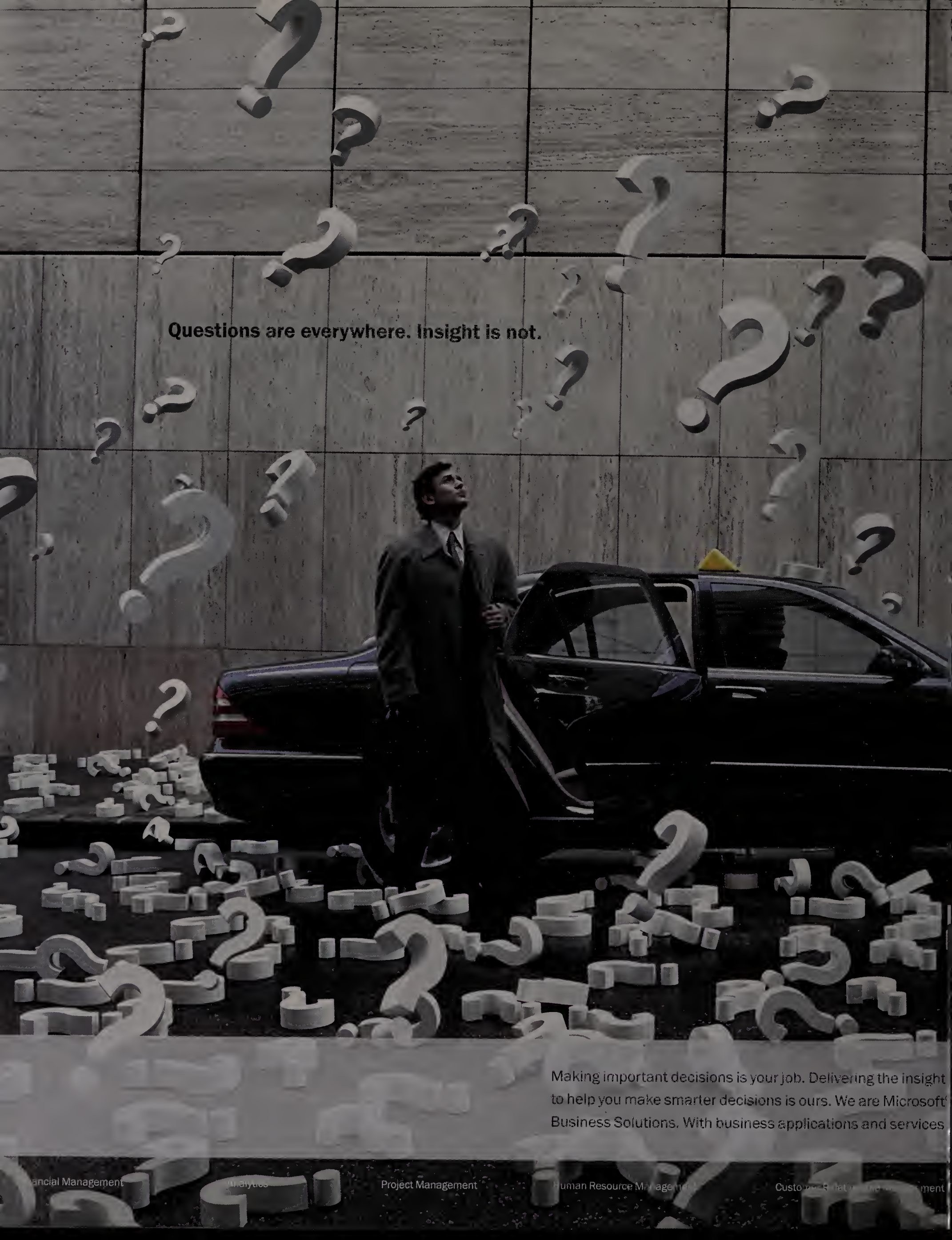
### PROJECT PERSONNEL

Key project personnel are listed ("University Sponsor" would be "Business Sponsor" in a company).

### FLEXIBILITY MATRIX

At the beginning of the firewall project, the university sponsor said that project scope was least flexible and schedule was most flexible. The project manager must explain the reasons for a yellow or red status.



A black and white photograph of a man in a trench coat standing in front of a wall made of large, square tiles. He is looking up at the wall, which is covered in numerous question marks of various sizes. The floor is also covered in question marks, some of which are floating in the air. The overall atmosphere is one of confusion and uncertainty.

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ment between IS and business leaders

- Encourage business leaders to think “team,” not “me,” and to take responsibility for projects

- Allow planners to schedule resources more efficiently

- Reduce the number of redundant projects and make it easier to kill projects

All that means more pennies in your piggy bank. Dennis S. Callahan, executive vice president and CIO of Guardian Insurance, and Rick Omartian, CFO of Guardian's IT group and chief of staff, claim that portfolio management has reduced their companies' overall IT applications expenditures by 20 percent and that, within that spending reduction, maintenance costs have gone from 30 percent to 18 percent. Eric Austvold, a research director at AMR Research, says companies doing portfolio management report saving 2 percent to 5 percent annually in their IT budgets.

There's no single right way to do IT portfolio management. Vendors, consulting companies and academics offer many models, and often companies develop their own methodologies. Off-the-shelf software is available from a variety of vendors (see “Tools of the Trade,” this page). But there are plenty of hurdles to doing it well. There are, however, best practices and key logical steps that can be gleaned from organizations such as Brigham Young University (BYU), DHL Americas and Eli Lilly, which have integrated portfolio management into the fabric of IT management, as you'll see in this story.

Here are the key steps in creating and managing your IT investment portfolio.

## Gather: Do a Project Inventory

Portfolio management begins with gathering a detailed inventory of all the projects in your company, ideally in a single database, including name, length, estimated cost, business objective, ROI and business benefits. Merrill Lynch maintains a global database of all its IT projects using software from Business Engine.

In addition to project plan information, Merrill Lynch's users—almost 8,000 from

Asia, Europe, India and the United States—add weekly updates on how much time they spend working on projects. “We use that as our internal cost assignment tool back to the business, so that the business is paying for every technology dollar monthly,” says Marvin Balliet, CFO of global technology and services.

When Kifer joined DHL Americas as vice president of program management in 2001, one of his first tasks was getting control of project portfolio activities. He created an inventory, put that into a master project schedule, gained an understanding of the resource requirements of all the projects, then did a reconciliation of the projects and

each of those units, compile a list of projects during the annual planning cycle and support them with good business cases that show estimated costs, ROI, business benefit and risk assessment. The leadership team vets those projects and sifts out the ones with questionable business value. At Eli Lilly, a senior business ownership council comprising the information officer and senior business leaders in each business unit takes on this role.

Next, a senior-level IT steering committee made up of business unit heads, IT leaders and perhaps other senior executives meets to review the project proposals; a good governance structure is central to making this work.

“Portfolio management without governance is an empty concept,” says Howard A. Rubin, executive vice president at Meta Group. Conversely, putting portfolio management in place can force companies with weak governance structures to improve them. (For more on governance, read “The Powers That Should Be,” at [www.cio.com/printlinks](http://www.cio.com/printlinks).)

One of the core criteria for which projects get funded is how closely a project meets a company's strategic objectives for the upcoming year. At clinical diagnostics company Dade Behring, an executive leadership team, which includes the CEO, creates five strategic initiatives, such as CRM or organizational excellence.

The IT governance council, made up of business leaders and senior IT leaders, then evaluates projects based on how well they map against those initiatives. “We also try to assess risk from a technology point of view, a change-management point of view, the number of people that a project will impact and whether it will involve huge reengineering,” says Dave Edelstein, CIO and senior vice president of regulatory affairs, quality systems, and health, safety and environment. Using methodology borrowed from the product development group (modified for IS, but keeping terminology that business executives are familiar with),

## Tools of the Trade

The portfolio management tool market is growing. In 2002, it was about \$85 million; it could reach \$540 million by 2005, according to Meta Group estimates. Here is a list of some of the major portfolio management tool vendors.

**ARTEMIS INTERNATIONAL** [www.aisc.com](http://www.aisc.com)

**BUSINESS ENGINE** [www.businessengine.com](http://www.businessengine.com)

**ITCENTRIX** [www.itcentrix.com](http://www.itcentrix.com)

**KINTANA** [www.kintana.com](http://www.kintana.com)

**PACIFIC EDGE** [www.pacificedge.com](http://www.pacificedge.com)

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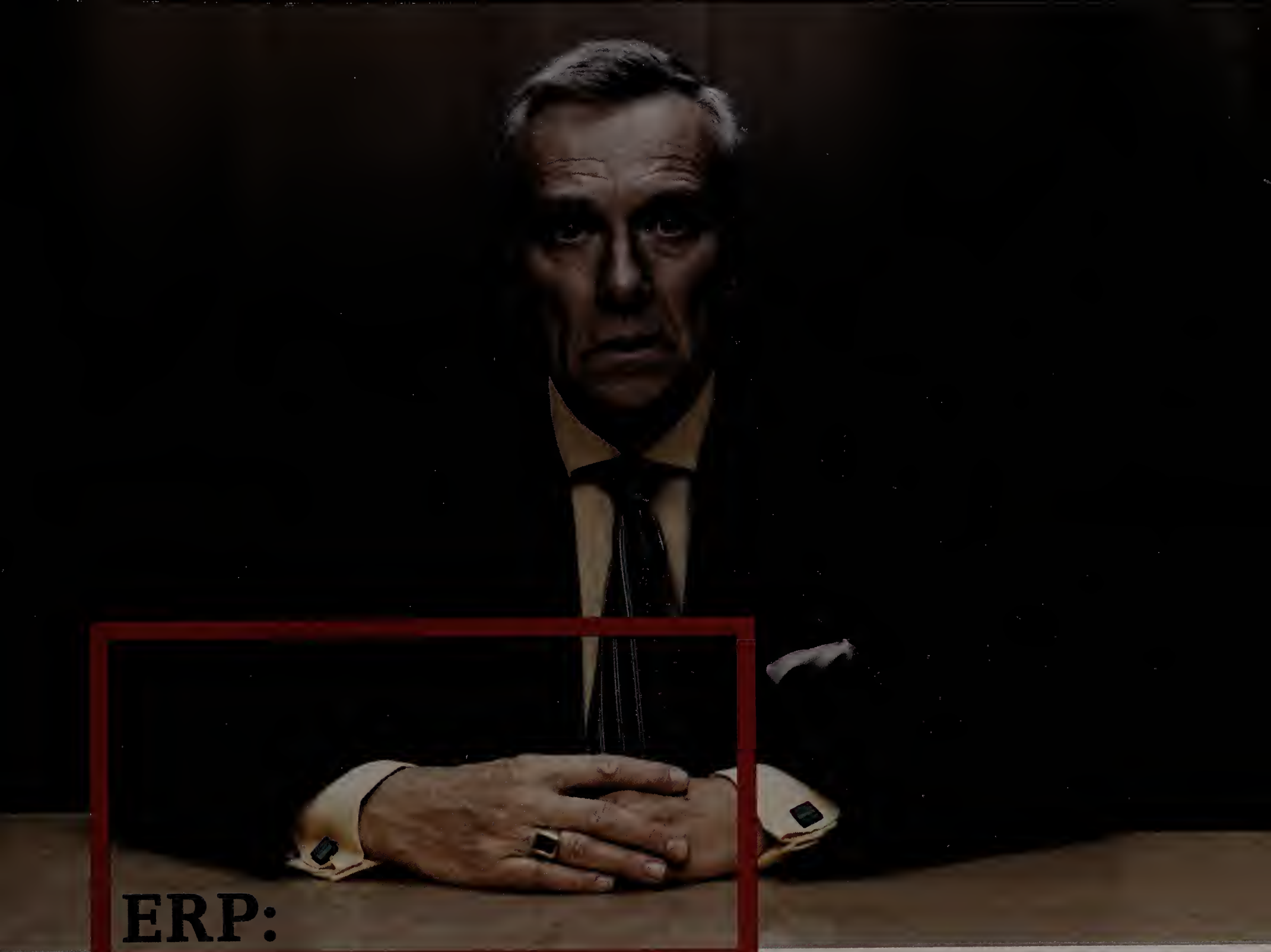
reduced the schedule to a manageable level.

Creating a project portfolio inventory can be painstaking but is well worth the effort. For many companies, it may be their first holistic view of the entire IT portfolio and any redundancies. A good inventory is the foundation for developing the projects that best meet strategic objectives.

## Evaluate: Identify Projects That Match Strategic Objectives

The next steps involve establishing a portfolio process. The heads of business units, in conjunction with the senior IT leaders in





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projects are placed “above the line”—those that should be funded—or “below the line”—those that shouldn’t.

At DHL Americas, a project portfolio review board evaluates the one-page project opportunity assessment for every proposal. Membership on the board includes IS and 12 vice presidents from across all areas of the business. “Those vice presidents are not the senior vice presidents—they’re the next level down, the lieutenants,” Kifer says. “Portfolio management doesn’t work at the senior vice president level; they don’t have time to commit to portfolio management.”

A good evaluation process can help companies detect overlapping project proposals

up front, cut off projects with poor business cases earlier, and strengthen alignment between IS and business execs.

## Prioritize: Score and Categorize Your Projects

After evaluating projects, most companies will still have more than they can actually fund. The beauty of portfolio management is that ultimately, the prioritization process will allow you to fund the projects that most closely align with your company’s strategic objectives.

Ernie Nielsen, managing director of enterprise project management at Brigham Young University, is a frequent lecturer on portfolio management and a founding director of Stanford University’s Advanced Project Management Program. He instituted an extremely thorough prioritization and scoring methodology at BYU.

Under his plan, projects are placed into portfolios—Nielsen thinks multiple portfolios are a good idea in many companies because they allow like projects to be pooled together. In his case, the IT department uses four: large technology projects (more than \$50K), small technology projects (less than \$50K), infrastructure technology projects, and one covering executive initiatives. Think of the first three as peer portfolios; the executive one is a slightly different animal. The main job of the executive portfolio management team (each portfolio has its own team) is to distribute funds appropriately to the other three. (There are plenty of other ways to categorize initiatives; see “Powerful Portfolios,” Page 58.)

In the case of the large tech portfolio, its management team—made up of project sponsors, function managers (for example, representatives from engineering, financial services and operations, and Nielsen himself) and product portfolio man-

agers (people with long-term project leadership responsibilities in areas such as student services or data management)—vetted projects and came up with a list of 150 for the portfolio team to score. (Nielsen uses Microsoft Project and Pacific Edge’s Project Office to plan and prioritize.)

They then prioritized them using a model that has four key tenets:

**1. Identify four to seven strategies.** BYU’s Office of Information Technology does this yearly (for example, limiting technology risk, increasing the reliability of the infrastructure).

**2. Decide on one criterion per strategy.** For example, the team decided the criterion for limiting technology risk would be whether the technology had been implemented in a comparable organization and the benefits could be translated to BYU easily.

**3. Weigh the criteria.**

**4. Keep the scoring scale simple.** BYU uses a scale of one to five. For the technology risk strategy, five might mean that it has been used in a comparable organization and the benefits could be transferred easily; three could mean it’s hard to do because it would require changing processes; one might mean they haven’t seen it work anywhere else.

Following the scoring, the team drew a line based on how many projects it could do with existing resources. In the case of the large technology portfolio, the line was calculated where demand (the list of projects) met supply (resources—in this case, the cumulative dollar value of available application engineers plus overhead); the line was a little less than halfway down the list. Those projects above the line could be done in 2003. The team then presented that list to the president’s council, which approved it in an hour and a half, a process that used to take weeks, according to Nielsen.

There is no one method to categorize your IT investment portfolio. One approach is to categorize it as you would your own financial portfolio, balancing riskier, higher reward strategic investments with safer categories, such as infrastructure. Meta Group’s Rubin recommends a portfolio divided into



Dave Edelstein, CIO and senior VP of regulatory affairs at Dade Behring, says that at his company, an executive leadership team evaluates projects based on how well they map against strategic business objectives.



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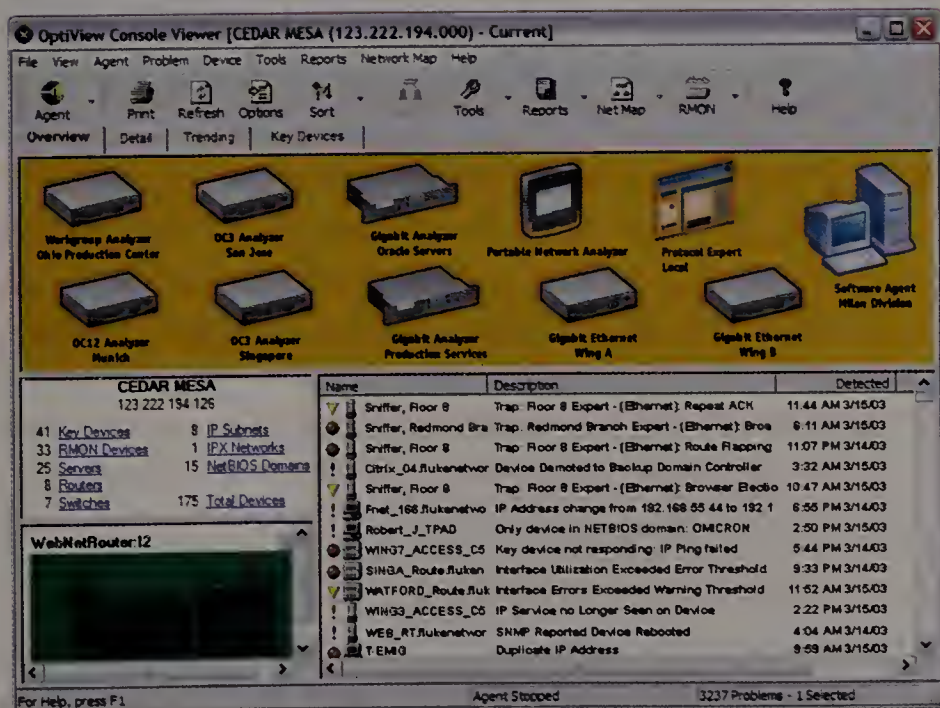
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three investment categories: running (keeping the lights on), growing (supporting organic growth) and transforming the business (finding new ways of doing business using technology). Those categories can then be cross-tabulated with four to five value-focused categories, such as how those investments support revenue growth, reduce costs or grow market share.

Since 1999, Eli Lilly has used Peter Weill's model to categorize its IT investments (see "Powerful Portfolios," Page 58, for a closer look at the model offered by Weill, director of the Sloan Center for Information Systems Research and senior research scientist at MIT's Sloan School of Management). Under the Weill model, companies view their IT portfolios on multiple levels and at different stages, by visualizing their investments in aggregate and placing them in four categories, with the percent of IT expenditures apportioned across each. "We tend to want to have 5 percent [of our projects] in strategic areas, 15 percent to 20 percent in the informational category, and the remaining percentage split between the infrastructure and transaction modules," says Sheldon Ort, Lilly's information officer for business operations. He says that at the enterprise level, those percentages have remained fairly consistent. That model allows Lilly to balance the risk and reward of its IT investments. (The average percentage of annual IT spend of the 57 companies in Weill's 2002 survey breaks down as follows: infrastructure, 54 percent; transactional, 13 percent; informational, 20 percent; strategic, 13 percent.)

The payoffs that come from a thorough evaluation and prioritization process is the primary reason portfolio management is so effective. First, communication between IS and business leaders improves. And portfolio management gives business leaders a valuable, newfound skill—the ability to understand how IT initiatives impact their companies.

Second, business leaders think "team," not "me," and take responsibility for projects. One tried-and-true method for how a business leader got money for his unit's projects was to scream louder than everyone else. Portfolio management throws that practice out the corner office window; decisions are made based on the best interests of the company. At BYU, Nielsen observes that after its portfolio process was implemented, "instead of vice presidents fighting for their own lists of projects, they noticed projects below the line, not in their areas. They said to one another, 'I could provide some funds for you to get [your project] above the line.'"

Third, portfolio management gives business leaders responsibility for IT projects.

## Dropping the Ball

Why so many companies fail to gain control of project portfolios

**89% of companies** are flying blind, with virtually no metrics in place except for finance.

**84% of companies** either do not do business cases for any of their IT projects or do them only on select, key projects.

**84% of companies** are unable to adjust and align their budgets with business needs more than once or twice a year.

SOURCE: "THE BUSINESS OF I.T. PORTFOLIO MANAGEMENT: BALANCING RISK, INNOVATION AND ROI," A META GROUP WHITE PAPER, JANUARY 2002

"I'm no longer in a position where I have to sell these projects to the business," says Dade Behring's Edelstein. "If I'm doing a project for marketing, it's the marketing exec who has to sell the project to the rest of the team." Merrill Lynch's Balliet says, "When we started, the technology people were proposing the projects. Now the businesspeople propose the projects and [take responsibility] for risk profiling, ongoing operational costs and timeliness of delivery."

Finally, everybody knows where the dollars are flowing and why, which is especially important to CEOs and CFOs who are increasingly demanding that technology

investments deliver value and support strategic objectives.

## Review: Actively Manage Your Portfolio

A top-notch evaluation and prioritization process is emasculated rather quickly if the portfolio is not actively managed following approval of the project list. Doing that involves monitoring projects at frequent intervals, at least quarterly. At Blue Cross and Blue Shield of Massachusetts, a project management office, which reports directly to Senior Vice President and CIO Carl Ascenzo, has that responsibility. Once or twice a month, the project management office gets financial and work progress perspective updates from project leaders. That information goes into a database, and Ascenzo reports to the entire company monthly, giving the project inventory and its status. He assigns project status—green (good), yellow (caution) or red (help!)—and includes an explanation of the key driver causing a yellow or red condition. The IT steering committee meets once a month to make decisions to continue or stop initiatives, assess funding levels and resolve resource issues.

At CKE Restaurants, the IT steering committee meets monthly to review at least three of the initiatives under way. "In my opinion, quarterly is too long," says Chasney. CKE, under the Carl's Jr., Hardee's and La Salsa Fresh Mexican Grill brand names, operates approximately 3,300 restaurants worldwide. Frequent reviews allow Chasney to redirect resources more quickly.

Monitoring project portfolios regularly also means projects that have run off the rails can be killed more easily. "People have an aversion to stopping projects, but the majority of projects I cancel are done because there's a change in company strategy—a change in priority or direction," says Chasney. For example, if there's a strategy decision to focus on SAP, then it makes sense to cancel a new system that interfaces with PeopleSoft, he says. Chasney states another simple but powerful principle that eludes



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many companies: "You can't complete projects just because you started them."

## Hurdles to Portfolio Management

Yes, portfolio management is a good thing. But getting to nirvana requires a serious commitment from both the business and IS sides, as well as a whole lot of sweat equity. Here are some of the pitfalls and ways to overcome them.

■ **Democracy ain't easy.** Taking power away from business leaders accustomed to calling the shots will not always go smoothly.

"Business leaders who didn't have decisions scrutinized previously now are [having] decisions decided by group consensus," says DHL's Kifer. But Kifer says that quickly "people realize it does work and that 12 people can make better decisions than one or two making unilateral decisions."

■ **There's no single software that does everything.** "There are really good budget packages, resource management packages and fairly good portfolio management packages, but no package that ties it all together," says Gordon Steele, CIO and vice president of IT at Nike, who is in the process of implementing portfolio management. (See "Tools of the Trade," Page 62, for a list of some leading portfolio management vendors.) Steele is currently exploring a partnership with a portfolio management vendor to see if such a software tool can be developed.

Do you need to buy portfolio software? There's no right answer. Some say it's a necessity. "It's a better investment now to buy rather than build," says Meta Group's Rubin. Gopal Kapur, founder and president

**IT initiatives need to be reviewed frequently, on a monthly basis if possible, according to Jeff Chasney, executive VP of strategic planning and CIO at CKE**

of the Center for Project Management, begs to differ. "Far too often people get the software and say they have portfolio management. But they don't—they don't have the foundation for portfolio management," he says. Microsoft Excel and Project are commonly used by companies to track and manage projects; some companies build their own tools.

■ **Getting good information isn't easy.** Take, for example, the transparency of your cost structure. "You need good information around all technology costs and investments," says Merrill Lynch's Balliet. In 1999 and 2000, he and his team looked hard at all the IT dollars and categorized them into service "buckets," then put them in charge-back buckets related to those activities. For example, Balliet says that they created a phone monitoring tool and told some units, "You pay for the calls you make."

In addition, you must update the database regularly. "You need to have the constant status of each project so you can react quickly to market changes," says Balliet.

■ **It's still hard to make tough decisions on whether to undertake—or cancel—**

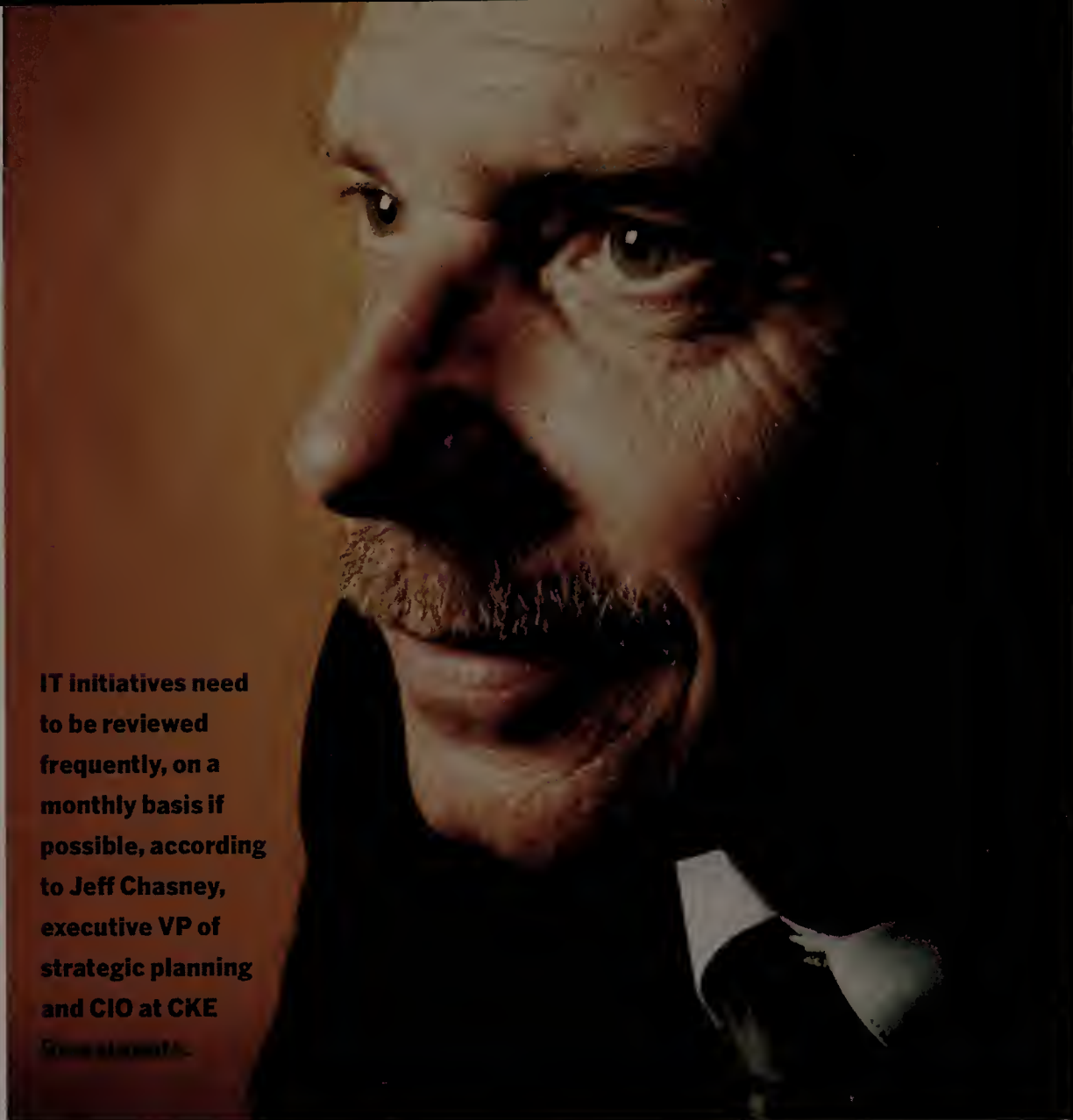
**projects.** Kifer, no slouch at portfolio management, says DHL Americas currently has 20 percent more projects in its portfolio than it can support. "We won't probably start half of those," he says. "[But] an organization has a tendency to say, You'll figure out a way to make those work."

■ **It's an additional time constraint on busy executives.** Good portfolio management means good IT governance means regular IT governance committee meetings. "Just about every company today has its people stretched," says Chasney. As noted earlier in the story, that concern is addressed at DHL Americas, where the lieutenants of time-constrained senior vice presidents serve on the project portfolio review board.

In the grand scheme, however, the challenges of implementing portfolio management pale in comparison to the value it brings to your IT investments. "It forces IT and businesspeople to talk about investments from a business perspective," says Weill. "That's its most powerful feature." **CIO**

Tell Senior Editor Todd Datz about your portfolio management process at [tdatz@cio.com](mailto:tdatz@cio.com).

**CIO.com** What's your take on **PORTFOLIO MANAGEMENT**? How do your colleagues' experiences compare with your own? That's the focus from May 1 to 15 of the CIO Best Practice Exchange, CIO's members-only online forum for IT executives. To join them, visit [exchange.cio.com](http://exchange.cio.com). (For qualified IT executives only. New members must apply.)





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**Dr. Tim Grieser** is responsible for performance and availability management software research in IDC's Enterprise Systems Management Software program. His coverage includes service level management for systems and applications across a wide variety of platforms.

# UNISYS PRESENTS **ask THE EXPERT**

*A few minutes with Tim Grieser,  
VP, Enterprise System Management Software Program,  
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## **Fight Data Center Complexity with Self-Managing Servers**

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All of these terms refer to putting more system management intelligence into software tools, so that problem detection, diagnosis and response can be performed automatically in an increasing number of cases.

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Quite real. Some aspects of self-management have been successfully implemented in production environments for a number of years. For example, scripted responses (such as re-booting a server) to fix common problems (such as running out of available memory space) are commonly deployed. Techniques such as event correlation are used to help determine which of several events is most likely to be the fundamental or "root cause" of a problem.

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> How does an enterprise implement these capabilities across dissimilar platforms, and are standards important?

Typically, there will be platform-specific management components (such as monitoring agents for Windows and Unix servers) linked to common management components such as "consoles." The common management components often deal with automatic responses to events, and also work with higher level constructs, such as applications and end-user views. Standards are useful in that they can enable easier data gathering, such as monitoring, across platforms. Also, system management tools often use standards to communicate information from basic monitors to higher-level management consoles.

**"What is really important in today's complex, distributed environments is to simplify the job of system management."**

> What can we expect from this technology three years from now?

The direction is clearly toward higher levels of automated responses, not only to fix operational interrupts or breakages, but also to address dynamic management of resources (such as dynamic load balancing and provisioning servers as needed) in order to achieve desired service levels. More and more, the objective is to reduce manual intervention to diagnose and fix problems, so that higher levels of scalability, performance and availability can be achieved.

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# Staff Alert

*With outsourcing on the rise, CIOs are at the center of a morale crisis. They can see many of their workers battling stress on the job. The best leaders learn to help employees now—and keep them in the future.* BY STEPHANIE OVERBY

**D**ianah Neff's staff was sick a lot last winter. But the CIO of the city of Philadelphia was worried that it wasn't just the record cold and snow that had her employees under the weather. With the city facing its worst fiscal crisis since 1991, Neff had been forced to cut 10 percent of her staff through an early retirement program. She started cross-training the remaining 535 to deal with increasing demands being placed on IT. Meanwhile, as each new project request came in, Neff was openly looking at whether outsourcing some work might be more cost-effective—another anxiety source for her already stressed staff.

"People have become anxious. We're watching to see if we're getting increases in sick leave or if other issues are occurring. People deal with the stress of layoffs and increased workloads in different ways," Neff says. "The staff is realistic. They know it's a tough job market. I don't know that you can ever really reassure people in these situations."

Neff expresses a pervasive feeling: 75 percent of 290 IT executives in a recent CIO survey said their top staffing concerns in 2003 are their employees' demanding workloads and staff burnout. At the same time, more CIOs are looking outside their company walls to fill their labor needs—37 percent plan to increase the use of outside sourcing options, such as contractors and outsourcers, to meet work goals in the next year, according to the survey.

## Reader ROI

- ▶ Why CIOs need to worry about workers even in a buyer's labor market
- ▶ How outsourcing threatens your IT workers
- ▶ Eleven tips to work effectively with staff under stress in tough times

PHOTO BY DOMINIC EPISCOPO





**Dianah Neff, CIO of the city of Philadelphia (center), is working to communicate more with her staff about efforts to do more with less. Neff sits among staff members, from left to right: Deputy CIO Michael Dean; Malayna Perloff, communications program manager; IS Administrator Jacqueline Henry; Neff; IT Director Viviant Jones; and Patricia Shaw, administrative assistant.**



Add to this fiscal funk such nonwork stressors as homeland security alert levels and the war with Iraq, and it's like the perfect storm for the IT staff. CIOs who think there's no real threat of turnover in tough IT times and put off dealing with the situation may be in for a rude awakening even sooner than the highly anticipated economic

Instead of waiting to see productivity slip, CIOs must to do everything they can *now* to prevent employee burnout, stress and doubt. (See below, "Eleven Simple Rules for the Care and Feeding of Your IT Staff." And for one CIO's tale of coping, see "How to Pass the Stress Test," Page 50.) Read on to share the experiences of CIOs who have

tional hazard," says Rick Skinner, CIO of the Oregon division of \$3.3 billion Providence Health System. "IT staffs are responsible not only for keeping current systems and infrastructure running, but they're also responsible for a whole host of new projects. Some are planned, budgeted and scheduled, and some come out of left field with no budget, no schedule and only a fuzzy idea of the deliverables. That kind of environment is by nature high stress."

But if 70-hour workweeks somehow became the norm in the best of times, the hours being clocked by IT workers today—with budgets stretched and expectations on the rise—are potentially unbearable. "Like every other IS organization out there, we're suffering from an incredible amount of demand. CEOs and CFOs want additional services, but they want it done for less," says Bruce Reirden, vice president and CIO of the Care New England group of hospitals. "So ultimately as CIOs, we're requesting people to work more just to get the jobs out the door. I couldn't even tell you what the average workweek is like here. Some weeks it's higher, some weeks lower. But it's always in excess of what people are scheduled for."

**46 percent** of IT executives laid off staff in the last half of 2002. New hiring is spotty: **30 percent** are looking for workers. Others will wait until later in 2003 (32 percent) or 2004 (another 32 percent).

turnaround. "Your best workers *will* leave and go somewhere else, and you'll be left with heavier workloads and fewer top performers," warns Diane Morello, a Gartner analyst. "We're already seeing the start of a workforce backlash. There's a subtle pulling back on the part of employees who are saying, If you're not going to help me put the brakes on [the workload], I'm going to do it myself."

learned the importance of adjusting office conditions—from establishing project management controls and making staff workloads more reasonable to recognizing top workers.

## A Familiar Feeling

High stress and heavy workloads are nothing new to IT; night and weekend work has been the norm for years. "It's an occupa-

# Eleven Simple Rules for the Care and Feeding of Your IT Staff

Techniques for doing more with less while keeping staff motivated

**1 Open up.** The key to helping employees deal with their worries—from layoffs to an outsourcing deal to a hellish project—is communication. "Employees are thinking, I'm a grown-up. Just tell me what's going on," says Linda Pittenger, CEO of People3, a Gartner company. "The great CIOs are very up front, and they keep the best people."

**2 Be a good buffer.** Don't take on more work than your staff can handle. Instead, explain the resources you have to business executives and invite them to help narrow priorities. If they have trouble understanding why IT can't do more, explain it differently. "Other operating departments are in the same boat," says George Brenckle, CIO of the University of Pennsylvania Health System. "The radiology department isn't going to be able to do more exams while it's

decreasing its staff. And as long as they're clear on what it is you're delivering, they understand."

**3 Put project management controls in place.** "There are always going to be busy times," says Steven W. Agnoli, CIO of law firm Kirkpatrick & Lockhart in Pittsburgh. "But even when there's more work to be done, having a very sequenced, systematic process to go through makes it less stressful."

**4 Increase employee accountability.** Giving individuals more control over day-to-day decisions actually alleviates their anxiety. "They want to be in control of their own destiny," says Rick Skinner, CIO of Providence Health System's Oregon division.



Linda Pittenger, CEO of People3, Gartner's HR consulting group, says that overburdening staffs is risky. "It can mean costs related to absenteeism and productivity decreases because people are depressed, or it can increase productivity but also increase the risk of burnout because people are working harder to keep their jobs," she explains.

Another downside to the current IT staffing environment is a decrease in innovation and a focus on the individual rather than the team. "In times like these people become risk averse. They don't want to share new ideas because there's no money in it," Pittenger says. "And what if the idea is bad? Do I want to be the guy who raises his hand and says we should do this, and then it fails?"

Some CIOs insert research opportunities, even modest ones, into their staff schedules as a way of developing staff skills—and relieving some of the workaday pressure. At Electronic Arts, a \$1.7 billion computer game maker, CIO Marc West insists his employees participate in niche R&D teams looking at where the business might be headed. "We run a pretty intense environment," he says. "But we ask employees to dedicate these very, very narrow time slices to R&D. They give up an

hour a week, but it gives them something positive to engage in. As a result, they find more time for other things and are better able to prioritize the work at hand." West admits the R&D time can get sacrificed. About 15 percent of the time (when things are really crazy), the teams meet for an hour every two weeks. And he will extend the time lines for ongoing R&D projects.

## Prioritization Is a Virtue

One thing has become clear as employees and other resources have become stretched paper thin: the importance of prioritization and project management skills. And that has to start at the top with the CIO. Otherwise the caliber of work coming out of the IT shop is destined to decline. "IT is the most project-oriented area of the business, but corporate IT still doesn't seem to be able to get project management down to a strong discipline," says Tom Pohlman, a Forrester Research analyst. "But if you completely overburden your staff and don't have good PM skills, the quality of work is going to suffer."

Darren Bien, CIO and COO of Keller Williams Realty International, found that out

## Stress Source

Forty-six percent of 290 IT executives surveyed said their use of outsourcers and contractors is permanent. See survey results at [www2.cio.com/research](http://www2.cio.com/research).

**In 2003, CIOs plan to increase their use of outside sourcing options in the following areas:**

|                                  |     |
|----------------------------------|-----|
| Contractors and contingent staff | 47% |
| Offshore outsourcing             | 18% |
| Onshore outsourcing              | 16% |
| Part-time staff                  | 16% |
| Interns                          | 13% |

SOURCE: 290 I.T. EXECUTIVES AND OTHER I.T. PROFESSIONALS RESPONDED TO CIO'S SURVEY ON I.T. STAFFING, ADMINISTERED ONLINE DURING JANUARY

**CIO RESEARCH**

in 2001 when 20 major initiatives were in the IT pipeline and not *one* was implemented. Even in industries that are doing well (Keller Williams' revenue grew 40 percent to \$530 million in 2002 thanks to low-interest rates), the danger is still there. "We've had to drive a much more process-oriented focus on project management," says Bien, who had 25 employees trying to complete those 20 projects. "Steering committee

**5 Identify individuals at risk.** Overwrought employees may be hesitant to complain, so seek them out. "If someone's working on a 40-hour project that's now 40 hours overdue, I will assign an additional resource to the project temporarily and reschedule the delivery date to alleviate the problem," says Bruce Reirden, CIO at Care New England.

**6 Cut the dead weight.** Consider weeding out the bottom 10 percent of employees. "We have redoubled our efforts to manage poor performers out of the business," says William H. Miller, vice president of information services at Harris Corp., a \$1.9 billion communications equipment maker. "It's not fair to the rest of the workforce who are busting their humps in tough times to have these poor performers by their side not carrying their weight."

**7 Walk a mile in your staffers' shoes.** "Now more than ever, I've found that I have to get down into the trenches and spend more time in my staff's workplace to make sure I'm aware of the pressures they're under and to show my support," says Kevin Molloy, CIO of Vancouver International Airport.

**8 Offer creative outlets.** Giving employees just a little time each week to devote to strategic, forward-thinking work rather than the immediate task at hand can go a long way toward staving off burnout.

**9 Get more bang for your training buck.** While you can't offer big bonuses to reward your staff, you can offer them free exposure to new skills—and often without a big budget. Explore alternative training options. Reirden

applied for a state-sponsored technology training grant, while Agnoli insists on cutting-edge training from his major vendors.

**10 Alert employees that outsourcing does present opportunities.** Show employees that the increased use of outsourcing or contract workers isn't just an excuse for layoffs. Show them the more strategic skills they can acquire in the new situation, such as business process management and systems analysis.

**11 Don't forget the recognition.** Making time to celebrate employees' successes is critical, whether it's a mention in a company newsletter or just a pat on the back in the elevator. And money (if you've got it) doesn't hurt either.

—S.O.



processes and prioritization put in place last year allow us to focus on what's important."

Providence's Skinner says he has to ensure that the projects his 300 employees are working on aren't ones more suited for a staff of 1,000. "I have to make sure that the things they're being asked to do are reasonable not only in terms of business value but also in terms of the resources we have," says Skinner, who's been dealing with declining margins in health care for nearly a decade. "I've found myself changing from a cheerleader trying to sell technology to the business to the gatekeeper trying to ensure that we make only those investments that increase business value and can actually be accomplished."

An effectual PM office helps to keep man-hours in check. "We know roughly what resources it will take to maintain our systems and also know how much is left over for project work. What we don't know is which resource will be required on what project when and whether that might conflict with some other project," Skinner says. "The project management office attempts to coordinate all the work."

But the process requires continuous tweaking. "It's impossible to forecast how many DBA hours we're going to need on a given project, much less all our projects six

months from now," he says, adding that the project management office makes weekly adjustments.

groups came up with creative recommendations with real business value that will be more widely accepted than if they were handed down from the top, Skinner says. One result: after employees pointed out that a 40-hour continuing education requirement did not ensure workers got the right kind of training, Providence managers will set training priorities and find ways to gain that expertise.

"Give people clear goals, resources to achieve them and the ability to make the day-to-day decisions. Even though they'll work harder, it's more enjoyable for them. That helps alleviate some stress," Skinner says.

Even with the best processes in place, IT employees still have to work harder these days. But CIOs can help alleviate the stress by simple communication—providing a light at the end of the tunnel for their staffs even if they don't necessarily see one themselves. "Most people can tolerate a certain degree of high intensity work if they see relief in the future—six, nine, even 10 months down the road," Gartner's Morello says, and leaders need to describe this road.

Cecil O. Smith, senior vice president and CIO of \$59.5 billion Duke Energy, spends significant time these days reassuring his troops. "If there's ever a time to be seen and be visible, it is now," Smith says. "With all the concern

sources of help in meeting IT demands—either for cost, skills, strategy or a combination of the three. According to our survey, 68 percent of CIOs increased their use of contractors and contingent staff during the past year, 23 percent increased their use of onshore outsourcing, and 18 percent increased their use of offshore outsourcing. For the next year, 47 percent expect to increase their use of contingent staff and contractors.

"CIOs faced with an already bare-bones staff are told to cut another 10 percent, and the most promising thing for them is to look at the offshore outsourcing market where they can theoretically save 30 percent to 50 percent in hard costs," says Morello. "If I'm a CIO in the United States and I'm being asked to continue to reduce costs after already extensive and radical cost-cutting, I have to justify why I'm not considering offshore."

But while using outside sourcing options can be a good way for CIOs to meet business needs with smaller budgets and fewer full-time staff, their introduction can increase in-house staff malaise. This is particularly the case with outsourcing. "People are very reticent and nervous," Morello explains. "If you are someone who has shown that you're a great technical person but that's all you have—you don't have any business process or management skills—your role is at risk because that work is moving overseas, and chances are you aren't moving to India with it."

Electronic Arts' West understood this issue when he began outsourcing 15 percent of the company's development work to two middle-tier Indian software companies, iEnergizer in Noida and Cybage Software in Pune. "We originally started sending work over there because of the nonavailability of talented staffing in the U.S., but that's not the situation today. Now we use it as a cost-effective solution," West says. To help address concerns that Electronic Arts' in-house developers will become obsolete, West has tried to position the Indian play as an opportunity. While he's discontinued hiring junior developers, he's encouraging his

**60 percent** of IT executives said the stress level among their IT staffs is high or very high. **43 percent** said stress levels are higher than a year ago.

months from now," he says, adding that the project management office makes weekly adjustments.

In addition, Skinner gives his employees more accountability. More responsibility to relieve stress? Sounds counterintuitive, but giving workers some control can go a long way. This year, for example, four employee action groups reviewed the annual employee satisfaction survey results and determined what direction to take—a process previously handled by Skinner's management team. The

about job security, the economy, a war, and what we've been through in rightsizing the company, the staff has got to be wondering, Will we be working here next week? or Will we be working on creative stuff? I say, This is one where we all have to help each other. We will be OK. We'll come out of this. You have to help carry that message yourself."

### Acknowledge the Outsourcing Threat

Many CIOs are also looking to outside



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existing stateside developers to learn systems analysis and gain more strategic skills, such as getting to know the business's order management processes to figure out what commercial software might be a good fit. "We're trying to make it an opportunity to develop skills around managing offshore projects and managing a distributed development environment," West explains. "There is always an underlying concern, and you can never take the full fear out of it. But we make sure it's seen as a way to get the job done better and faster, and not just cheaper."

The same people issues crop up with onshore outsourcing. George Brenckle, CIO of the University of Pennsylvania Health System (UPHS), outsourced the majority of his department to First Consulting Group, a health-care IT services company. First Consulting took over 170 of Brenckle's IT employees in 2001 just after the hospital system posted a loss of \$200 million, leaving just 30 employees in-house. "You can never 100 percent relieve the anxiety of outsourcing, but we were very open so the employees knew who we were talking to and what we were finding," Brenckle says.

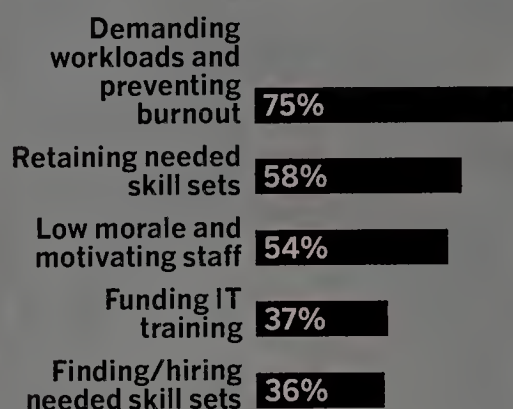
Brenckle was so concerned about employee reaction that in the end, 25 percent of the contract with the outsourcer addressed staff issues, such as guaranteeing that the outsourcer would retain all UPHS employees for at least a year and ensuring that turnover would be less than 2 percent. The pact kept some benefits, such as tuition reimbursement, that UPHS employees have. Still, the outsourcer saw two turnover peaks—one at the switchover and another 18 months later when some workers transferred off the UPHS account. But Brenckle knows it could have been worse. Remaining employees, whose stress levels skyrocketed initially, eventually got used to the idea of managing staff that actually worked for another employer.

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## Morale a Top Concern

While CIOs say they will use more outside help, they remain concerned about full-time employees

**CIOs' top staffing concerns for 2003:**



SOURCE: 290 I.T. EXECUTIVES AND OTHER I.T. PROFESSIONALS RESPONDED TO CIO'S SURVEY ON I.T. STAFFING, ADMINISTERED ONLINE DURING JANUARY

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"Outsourcing is the kind of thing where you have to include your staff on the journey. You have to be very open," Brenckle says. "Because the reality of it is that you have an IT department to run before you outsource, and you're going to have an IT department to run after you outsource."

"CIOs will spend tons of money analyzing who the right outsourcer is and on which piece to outsource, but when it comes to focusing time and money on people issues, they say they can't afford it. But that's the one piece that really matters," says People3's Pittenger. "Bring companies in to hire your people or have the outsourcer hire them. Take the business strategy and make it work for your employees. It doesn't have to be a win-lose situation. Besides, you have survivors inside who aren't going to stay if they see how you treat the people who don't stay."

Keller Williams Realty's Bien admits he made a mistake when he outsourced strategic development to an IT consulting group a year ago. "There's a lot of internal skepticism when you enter into a long-term relationship like that, and the outsourcer is doing all the neat and cool stuff, and your internal staff is keeping the wires together," says Bien, who recently reinsourced that

work. "As we go forward, we only outsource commodity services in the short term. And what we will keep in-house forevermore is the development of strategic platforms that differentiate us. It's an employee satisfaction issue. And no one will understand your strategic needs better than the people whose livelihood depends on the success of the company."

## Get Used to This

But what CIOs want to know more than anything is when will this period of deflated budgets, inflated stress levels and increased pressure to use outside sourcing options end? Unfortunately, there's no solid answer to that just yet. "There's a yearning [among IT employees] for things to go back to the way they were two or three years ago," says Pittenger. "But that period of time was so artificially inflated we'll never get back to that."

And while budgets have begun to inch up a bit, according to Forrester's Pohlman, IT hiring is still trailing the slight budget increases. "This problem is going to continue to get worse," he says. "Although we're seeing some CIOs start to increase their spending, they're not increasing their hiring [as much]."

Though not rosy, the situation does paint a clear picture of what CIOs need to do—everything they can to take care of their workers.

In Philadelphia, city CIO Dianah Neff seeks help and understanding. She's looking into automation tools that might help her small staff deal with bigger workloads. She's telling her city IT governing board that there's only so much her staff can do. And she's communicating like crazy with her employees.

"Communication is the best stress reducer. The staff feels at least a little less stressed if they understand what is going on," Neff says. "If they aren't worried about what management is doing, they can focus on their jobs or finding creative ways to do more with less." **CIO**

Contact Senior Writer Stephanie Overby via e-mail at [soverby@cio.com](mailto:soverby@cio.com).



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## W. Brian Arthur

Citibank Professor of the Sante Fe Institute, shares his views on how IT is being reinterpreted by old, traditional industries—resulting in completely new sub-industries such as genomics, proteomics, financial engineering, smart pharmaceuticals, nanotechnology, and the like. They are being born out of IT, and will change our lives and our businesses.

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## Abbie Lundberg

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"If you were an economically rational person, what you've spent in the past wouldn't influence your behavior in the present," says economist Dan Ariely.



# Why Good CIOs Make Bad Decisions

Dan Ariely's research in behavioral economics seeks to explain why CIOs make poor investment decisions and why they don't know what technology is worth

As a CIO, you're familiar with the following scenario: You've sunk \$900,000 into a forecasting system that's expected to cost \$1 million but has yet to deliver on its promises. In hindsight, you've realized that all that money would have been better spent on a sales-force automation (SFA) system. Nevertheless, you've still got \$100,000 in your coffers, so instead of scrapping the forecasting system and starting anew with SFA tools, you sink the remainder of your money into the forecasting system and hope for the best.

A foolish mistake? Perhaps, but not at all unusual, according to Dan Ariely, the Luis Alvarez Renta professor of behavioral economics at MIT's Sloan School of Management and director of the MIT Media Lab's e-rationality research group. As a behavioral economist, Ariely studies how people make decisions in real life and why their decisions often deviate from classical economic models, which assume that people act rationally and in their own best interests.

Ariely, 36, takes a self-described "armchair" approach to that discipline.

"I look at how I behave. When I find something curious or bizarre about myself, I tend to look at it in more detail," he says.

For example, Ariely's own tendency to procrastinate led him and a colleague to study different measures for overcoming procrastination. They found that people are willing to set their own deadlines so that they don't wait until the last minute. Yet while self-imposed deadlines help people improve their performance, they are not as effective as deadlines set by others.

Ariely, with his self-examining style, is one of a handful of academics challenging the intellectual foundation of economics. For years, classical economists



maintained that individuals make decisions based on their own self-interests. Ariely's research on procrastination, how people value goods, how they perceive pain and the effects of female physical beauty on the male brain reveals the exact opposite: Individuals make irrational decisions that are not in their best interests.

What may interest CIOs most are Ariely's investigations into how people value goods and how people's experiences of physical and psychological pain affect their decisions. CIO Senior Writer Meridith Levinson caught up with Ariely at his home in Cambridge, Mass., where he explained his research, discussed it in the context of the irrational decisions CIOs make and shared his thoughts on what CIOs can do to make more rational financial decisions.

**CIO: Your research shows that people, including CIOs, don't know how to value or set prices for various goods. How did you come to that conclusion?**

**Dan Ariely:** We [Ariely and fellow researchers Drazen Prelec and George Loewenstein] conducted a second-price auction in class. We sold MBA students keyboards, [computer] mice, bottles of wine, DVDs, books and chocolate. We explained the procedure for a second-price auction where the highest bidder pays the second highest bidder's price. We described each of the products and said to the students, "Before you tell us your bids, please tell us the last two digits of your Social Security numbers and translate those last two digits into a dollar figure." So if your last two digits are 44, that's \$44. Then we asked them to tell us whether they would pay the amount of money indicated by the last two digits of their Social Security numbers for the various products.

**What did you find?**

The people with the highest Social Security

numbers, in most cases, bid 100 percent more than people with the lowest Social Security numbers.

**In that experiment, you were also testing a concept called coherent arbitrariness. Can you explain what that is?**

It's the idea that people do not know how much to pay for anything. They will rely on their own arbitrary judgments to generate a value, and the value they generate will be coherent in the sense that it will be based on the value of a similar item. For example, when we sold a large box of chocolates and a small box of chocolates everybody said,

similar products in the past. "That database was \$2 million. This database is twice as big so we should be able to pay at least \$4 million." It's hard to figure out the value of an IT investment. If what you're willing to pay is a function of what you paid before, that's a problem because it means you don't know what it's worth.

**Is hardware an exception to what you've found, since its price decreases every year?**

The fact that the cost of hardware decreases every year is an additional factor people take into consideration when estimating a price.

They still set prices in a relative manner. They begin with the starting level price—what they paid last year—then they adjust it based on factors that seem relevant. In the case of hardware, you're expecting prices to go down.

**How should CIOs evaluate the value of a database or any other IT investment?**

They should not compare databases to databases. They should compare the database with all possible IT investments. People have a tendency to make decisions in silos. We think about whether or not to invest in a new database or to allocate salaries separately. It's better to think across categories to

find out where the best value is. Should we update software? Hardware? Move to a new operating system?

**Can you explain why people rely on those apples-to-apples comparisons to determine or rationalize what they're spending?**

It's so simple. It's seductive. It appears rational.

Evaluating these things is hard. I don't want to say people are stupid. Go back to the example I gave you with the box of chocolates. How do you evaluate the value of a piece of chocolate? You know what its sweet taste and soft melting texture is like,



Dan Ariely

"We'll pay \$X more for the big box than the small box." Once the price of a product [in this case, the small box of chocolates] was fixed, the prices of similar products were set in a relative manner.

**How does that research apply to prices that CIOs pay for IT?**

Imagine that an organization is thinking of creating a database. Why does it care what Oracle thinks [the database] should cost? Theoretically, the company should be able to say, "How good is this [database] for us?" Often it relies on prices that it or others have paid for





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but how you translate that into money is quite complex. And chocolate is supposed to be easy. Theoretically, you do this all the time. So how do you deal with a database? How do you take all of its complexities into account? People use these heuristics, these shortcuts, these relative comparisons that seem to give us the reason to make choices. A lot of times you don't compute; you just look for reasons to do one thing over another. Those are reason-based choices.

**A lot of companies are holding back on IT investments because of the weak economy. Are they acting irrationally?**

It's hard to say for sure. It's a question of how you look at your portfolio of decisions. Do you look at the decisions one at

side and don't take the risk. You're risk averse. If an organization thinks of 10 decisions separately, it might not take enough risk. When you think about a lot of gambles, or when you look at all the decisions together, you take on much more risk because the fear of losing a lot on a single project is mitigated.

**In essence, companies are being irrational if they are evaluating IT investments in a silo; whereas if they are evaluating them as a portfolio, they are being rational?**

It's irrational when the outcome of their decisions is different when they evaluate their investments one at a time as opposed to all together. It's fine to look at investments separately if the outcome is the same as when

pany. You have a project. The project is established to cost \$1 million. You've already spent \$900,000. The sunk cost is what you've already spent. It's the idea of throwing good money after the bad. Then you find out there was a better project to pursue. Would you spend the next \$100,000 to finish the project? Would your answer be different if you hadn't [already] spent \$900,000? You made a decision. It didn't turn out as you wanted. If you were an economically rational person, what you've spent in the past wouldn't influence your behavior in the present. It's the same if you invest in some legacy system and the payments will last five years, and after three years, you discover it's not really what you need anymore. Are you likely to switch if

“When companies look at investments one at a time, they're more risk averse. Being risk averse can be a very bad thing for a company.”

—Dan Ariely

a time or in total? For example, if I asked you to play a game where I flip a coin and if it lands heads, I give you \$140. But if it lands tails, you give me \$100. If I asked you, “Would you play this game once,” you'd say no. If I asked you, “Would you play this game 100 times,” you'd say yes. Why should things be different if you play something one time or 100 times? This is something called Samuelson's Paradox. When you focus on one decision and realize the downside, you focus on the down-

side and don't take the risk. The problem is, I suspect the outcome is not the same.

**In light of your explanation, is taking a portfolio management approach to IT investments a good idea for CIOs?**

Yes. When companies look at investments one at a time, they're more risk averse. Being risk averse can be a very bad thing for a company. (For more on portfolio management, see “Portfolio Management: How to Do It Right,” Page 56.)

**Related to being risk averse, CIOs also fall victim to making IT investment decisions based on money they've spent in the past, a theory you refer to as the sunk cost. Can you explain what's irrational about it?**

Imagine this scenario: You work in a com-

pany. You're still making payments on the old project? It might be very painful to purchase the new one if you're still making payments on the old one.

**What should CIOs do when a more worthwhile project or investment comes along after they've already spent a lot of money on something else?**

Again, they should think about what's the best use of a dollar and ignore the past. I'm saying it as if it's an easy thing to do. It's not.

**CIOs often hire consultants that tell them what they already know or what they want to hear. How does your research explain that seemingly irrational decision?**

It's an issue of accountability. People don't

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want to make mistakes. They're afraid to be fired. They're afraid their bonuses will be affected. People are trying to cover their tracks. They hire consultants to tell them what they already think. It's like IBM used to say, "Nobody ever got fired for buying IBM."

You can also ask the question, are consultants really free to find what they want? It's an issue of conflict of interest. If I'm being paid by you, I like you, and you want me to find X, am I really going to find that X is wrong? There are dependencies in these relationships.

**You've found in your research that pain and people's experience of pain, whether physical or psychological, often cause them to make knee-jerk decisions. Could you elaborate on the experiment you did in this area?**

We put someone in a wet suit with tubes running through it that carry cold and warm water. We ran cold water through the wet suit, cooling him down to 46 degrees Fahrenheit. That's very cold. We tell him that we're starting the experiment, and we change the water temperature. So he started off being very cold, now the water becomes wonderfully warm. Then we cool the water off again. Then we stop changing the water temperature and ask him, "How painful was this?"

**What did you find?**

That people's perception of pain depended on the pattern of pain.

**What are the implications of that experiment, and how do they tie in with the research you've done on irrationality?**

Say you use an ISP that improves its reliability from 80 percent to 90 percent. That ISP's reliability is perceived as better than an ISP whose reliability is consistent or started at 90 percent and went down to 80 percent. If things improve, we are happy. **CIO**

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# ASPs

## THE NEXT CHAPTER

*Application service providers are increasingly viewed as a viable solution in the CRM space, particularly for small and midsize companies*

BY MERIDITH LEVINSON

Allied Office Products lost \$8 million worth of business when the World Trade Center,

where many of its customers worked, was destroyed. In the aftermath of the tragedy, the \$300 million office products company was forced to lay off employees and reevaluate its entire business and sales strategy. Executives came up with a plan to generate new accounts and reactivate those that had lapsed. They also decided they needed a sales-force automation (SFA) system that would improve customer service and enhance sales employees' productivity. They eventually zeroed in on an ASP that promised reasonable costs and a quick turnaround.

However, ASPs held a number of negative connotations for Allied executives, who remembered the ASP meltdown in 2000, when scores of hosted software companies went out of business after the dotcom collapse. COO Mike Palmer, who was CIO at the time his company was searching for an SFA product, worried that the ASP he had settled on—SalesForce.com—might go out of business in the chilly economic climate for IT spending. He was also concerned that a hosted solution couldn't be customized or easily integrated with his company's back-end systems. And he obsessed about whether the ASP could provide adequate protection for his company's crown jewels—its customer data.

But in spite of those reservations, he made the leap of faith because of SalesForce's cheap price tag and promise of fast implementation. Allied began rolling out the

### Reader ROI

- ▶ Why ASPs may provide a viable solution for sales-force automation
- ▶ How some companies have used ASPs for online customer self-service
- ▶ Whether ASPs are the right fit for your company

PHOTO BY CLIVE FROST





Much to his surprise, Dave Bevan, general manager for e-service for British Airways, found that integrating and customizing a hosted solution was no more difficult than integrating a licensed software package.



SalesForce.com product to its 220 sales and sales-support employees in April 2002.

Two months later, 165 salespeople were using the hosted software, and Palmer was in for a big surprise. The concerns he had had about the vendor's financial stability, security and service levels turned out not to be major issues. And while not trivial, the obstacles his company ran into integrating SalesForce.com's team edition with its legacy systems were surmountable. The biggest problems Palmer confronted with the hosted solution had to do with the age-old bugaboo of convincing salespeople to adopt new processes and tools—the same change management issues that bedevil any technology implementation, whether done in-house or hosted.

If Allied's experience with SalesForce.com is any indicator, it may be time for CIOs to get over their (not unfounded) aversion to ASPs. Those who witnessed the collapse of the ASP market (when revenue growth declined by 86 percent from 2000 to 2002) might still have a lingering bad taste in their mouths. But in the CRM space at least, ASPs

are increasingly being seen as a viable solution, particularly for small and medium-size companies. The surviving vendors have matured and largely rectified the security and service problems that dogged them in the past. CIOs, of course, still have to be on their guard against overblown promises that ASPs—or any vendor for that matter—make about instantaneous ROIs and quick deployments. While ASP deployments are quicker than packaged implementations, they still take longer than the vendors say they will, and the ROI always takes longer to achieve.

Even so, an increasing number of companies, including Allied, British Airways, Sovereign Bancorp and engine manufacturer Briggs & Stratton, have made the ASP model work for them. British Air found ways to integrate a hosted customer self-service application with its customer database and was pleasantly surprised to learn that a small ASP could support its huge, international Web presence. Sovereign discovered a hosted SFA solution that was so easy to customize that the company could put the task of customizing the application in hands of the non-IT employees. And Briggs & Stratton found that letting an ASP host the customer self-service application on its website ultimately resulted in zero downtime for the site. For those enterprises, going with a hosted solution turned out to be easier and less costly than rolling out and maintaining an enterprise software package themselves.

"If you go with a client/server-based application, you have to deal with both the technical implementation and the cultural issues," says Allied's Palmer. "With an ASP, all of the technology is sitting in their data centers. All you have to worry about is adoption."

### Overcoming Your Fears

One of the biggest worries CIOs had about ASPs in their heyday was security. Would their hosted data be secure from competitors, hackers, the outside world?

Bill Patten, director of MIS and project administration for Sovereign Bancorp, a

\$342 million bank headquartered in Philadelphia, was particularly obsessed with the security issue. So while the idea of a hosted solution for sales-force automation appealed to him, Patten and his IT staff spent weeks researching the security measures their ASP candidate, Salesnet, had installed before signing on in the fall of 2001.

The staffers began by visiting Salesnet's data centers in Boston. They evaluated the firewalls, encryption techniques, socket security features, intrusion detection systems and other protections the vendor had on its servers. They also asked to see the results of Salesnet's own security audits. Eventually, they came back with a thumbs-up.

"It took a while for us to become convinced that the privacy of our customer information was never at risk," Patten says. The MIS director was also reassured by the fact that Salesnet, which was founded in 1997, had not only survived the dotcom collapse but was steadily expanding its network of profitable customers.

Patten's next big concern was how easy (or hard) it would be to customize the Salesnet application. He knew he wouldn't be able to change the underlying code, but he also knew he couldn't do that very easily with packaged applications either.

What Patten discovered was that the Salesnet product would allow his company to tailor the application's user interface according to Sovereign's sales processes and lexicon. The customization was so easy, in fact, that administrative assistants throughout the company could do it.

Using pull-down menus, drag-and-drop fields and point-and-click maneuvers, the administrative staff mapped Sovereign's sales process to the software to create whole new layouts of information, modify existing layouts, change the way fields were labeled, and design pick lists (drop-down menus of information that salespeople can select). Patten says the application was rolled out to 325 employees in six months.

Salesnet has "these analysts that work with you to help you figure out the processes you have and how you're going to cus-

## Five Reasons Why an ASP May Work for You

Here are criteria you can use to evaluate whether a CRM ASP is right for your company

- 1 You don't have an IT staff, or your IT staff is small.
- 2 You don't have a big technology infrastructure.
- 3 You don't have well-established, deeply ingrained sales processes.
- 4 You don't have the luxury of 12 to 18 months to deploy an application.
- 5 You don't have or don't want to spend a lot of money.

—M.L.





**When Mike Palmer, the former CIO of Allied Office Products and now COO, signed up with an ASP for sales-force automation, he still had to deal with recalcitrant users who didn't want to use the new tools and processes.**

tomize their application to them, which is pretty amazing," says Paul Greenberg, author of *CRM at the Speed of Light*. He believes that "Salesnet does the best job of all the ASPs in customizing the application according to its customers' sales processes."

Patten would agree. He says the customization his staff had to do didn't cost the company more money. "It doesn't drive up the cost even incrementally because of its simplicity," he says.

British Airways was also pleasantly surprised by its experience in customizing and integrating an ASP solution. The \$11.9 billion airline had signed a contract with RightNow Technologies to automate the creation and management of different FAQ pages on its website, BA.com. British Airways knew it would have to radically change the ASP's standard product to suit its exacting needs. For instance, the airline needed to automatically develop, manage and post different sets of FAQs for different customers, depending

on whether they were members of British Air's loyalty program. If the customer was enrolled in the program, the technology had to identify his tier (low, middle or high end). That way, if British Air offered a special promotion exclusively to top-tier members, it could post information about that promotion in a Q&A format on a page that was accessible only to top-tier members and not to lower-tier participants or other customers.

Setting up this capability meant that British Air's customer database and Web authentication system had to pass customer information to RightNow in real-time so that the ASP could identify customers based on their membership status and provide the appropriate FAQ page. Dave Bevan, British Airways' general manager for e-service, says that getting RightNow's eService Center application to dance to his company's tune was not easy. "It was quite challenging because we were trying to do things quickly and were quite demanding of time scales,"

he says. Daniel Butcher, lead developer with British Air on the RightNow project, says the integration work his company and RightNow needed to do was trickier than he had anticipated. The difficulty lay in preventing end users from being kicked off BA.com and onto RightNow's website—a fix that required writing a small application to parse HTML and make sure hyperlinks were requested through British Air's server.

Despite those difficulties, British Air met its deadlines and launched the product on schedule. Bevan attributes that success to the chemistry between RightNow's and BA's staffs. "The two teams got on remarkably well. There was quite a positive attitude on both sides of the house, and that did see us through," he says. In sum, he says integrating a hosted solution was no more difficult than integrating a licensed software package.

When ASPs first emerged in the late 1990s, they had a lot of problems with scalability and service levels. Those early ASPs didn't have the right infrastructure to support "multi-tenancy," or lots of different customers. But the new breed of ASPs in the CRM space has largely mastered the multi-tenancy architecture and service issues.

In fact, these companies seem willing to bend over backward for customers. RightNow completely changed its application so that it could do what British Airways needed with no effect on the ASP's other customers, which simply continued to use RightNow's standard application. Realizing that potential customers in other industries such as retail and hospitality would also want to customize FAQs according to different customer segments, RightNow eventually built that functionality into its product.

British Air was also reassured that RightNow could handle its daily traffic by observing the volume the ASP's other customers were putting on its server. "They were able to show us hard data on their capacity," Bevan says. "They were able to show us what they could do currently and what they were investing in."

In addition, RightNow offered British Air a free trial of its software. But the true test of



whether RightNow could handle British Air's site traffic came immediately after 9/11, when hundreds of thousands of users flocked to the website for information. Bevan says the airline's call center would never have been able to handle all of those inquiries. "September the 11th cruelly demonstrated that this tool did meet the

roll out their ASP applications.

Cost savings can also be a red herring. While CRM ASPs are considerably less expensive than client/server-based applications (ASP customers don't have to worry about capital expenses associated with infrastructure), the cost does catch up after about four years because you're paying a monthly fee for

IT staff or don't want to burden their small IT staffs with CRM implementations. But Forrester's Chatham expects ASPs will soon be a popular choice among Fortune 500 companies. "Over time, there's no reason why a [hosted] model won't scale to thousands of users," he says.

ASPs are, in fact, starting to infiltrate the

# Beware the promises that some ASPs make about quick deployments and speedy ROIs.

promises made by RightNow," says Bevan.

Briggs & Stratton, a \$1.5 billion manufacturer of engines for lawn mowers, motor boats and snowblowers, has experienced virtually no downtime since it opted to let RightNow host its eService Center application, according to Michael Del Valle, the company's e-customer support coordinator. He says upgrades also proceed fairly smoothly with the ASP. "You can schedule your upgrade, get a test website, work with the test site and upgrade in a matter of days," he says. "The support from RightNow is solid enough that if you have a problem, the personnel can in many cases fix whatever the problem is."

## Debunking the Hype

In an effort to compete with the large CRM vendors, ASPs do sometimes make heady promises about their quick and easy deployments, speedy ROIs and bargain basement prices. Beware these sells. Only one company that *CIO* spoke to, Electronics for Imaging, managed to roll out an ASP CRM application to 100 out of its 125 users in four weeks. Part of the reason the deployment went so quickly was because Electronics for Imaging did not try to integrate the product with its SAP back-end systems. If your company needs to do customization or integration, you can count on a longer deployment time. On average, the companies *CIO* interviewed took five months to

the ASP service for as long as you run it, says Bob Chatham, principal analyst with Forrester Research. "In the long run, the hosted applications only have a 25 percent cost advantage over licensed software," he says.

While ASP deployments may be easier from a technical viewpoint, their customers still have to deal with recalcitrant users who don't want to use these new tools and processes. And ASPs don't provide much—if any—help in the area of change management. Allied's Palmer says his company had to come up with its own incentives to get salespeople to use the product. Allied, for instance, created a tele-prospecting group that does all the time-consuming legwork associated with lining up sales calls, freeing up salespeople to make more calls and thus, increase their commissions. But since only sales employees who actively use Salesforce.com are given access to the tele-prospecting group, even the most stodgy salespeople at Allied have begun using the hosted software just so they can have someone else make all the tedious cold calls.

Perhaps because of the creative way Allied got its employees to use Salesforce.com, the company is seeing a substantial return on its investment. Of the \$180,000 in new sales his company generated in January 2003, Palmer attributes 25 percent, or \$45,000, to Salesforce.com.

The vast majority of companies deploying hosted solutions today are small and medium-size businesses that don't have an

big guys. Staples, an \$11.6 billion office supply retailer, recently deployed Salesnet to its 500 sales employees to track demand and forecast revenue.

These days, the only other threat to ASPs is Microsoft, which released its CRM product last January. Greenberg predicts the software giant will undoubtedly steal a large piece of the CRM pie. "They've got the marketing muscle, the dollars, the functionality, the engineers, and the fears they strike in the hearts of other vendors," he says.

The bottom line, Chatham says, is that if an application meets your needs, you shouldn't worry about whether it is hosted or licensed. Instead, when it comes time to select a vendor, consider the basics, like the company's financial stability, its reputation and market position, and the quality, price and potential benefits of its application. "The hosted versus licensed issue is overplayed," Chatham says. "A lot of the issues people throw up around hosted data are really misplaced." **CIO**

Share your ASP stories with Senior Writer Meridith Levinson at [mlevinson@cio.com](mailto:mlevinson@cio.com).

## cio store

Still trying to get a handle on CRM? Our latest **CIO FOCUS** offering, a guide to **CUSTOMER RELATIONSHIP MANAGEMENT: MAXIMIZING REWARDS, MINIMIZING RISKS**, is on sale now at [www.theciostore.com](http://www.theciostore.com).





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# from private to public

Private-sector CIOs are bringing new levels of expertise to government IT. And public service teaches CIOs skills that the private sector is finding ever more essential. BY TRACY MAYOR





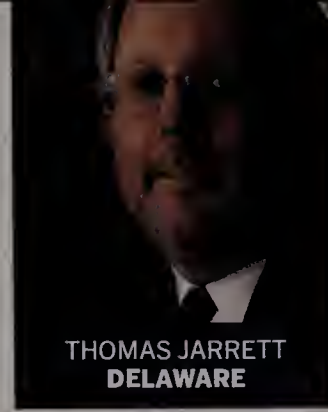
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Not exactly a job you're dying to nail? Well, during the past 18 months a slew of top CIOs from corporate powerhouses such as Disney (Stuart McKee), EDS (George Newstrom) and Verizon (Thomas Jarrett) have said yes to jobs very much like the one described above: the job of state CIO.

It's something of an emerging trend. All over the country, senior technology executives are jumping from the private to the public sector. Their motivation, surprisingly, isn't entirely post-9/11 altruism or, conversely, disgust with corporate financial scandals. Being a government CIO, it turns out, can be a great job, and it can be a great stepping stone to the next job.

Of course, you won't get rich. Salaries run 20 percent to 70 percent less than what's being offered in the private sector. (One state CIO now earns less than he used to pay in taxes at his old job.) Instead of cash, the state CIO position offers compensation in the form of power and authority. State CIOs exercise control over a broad range of services, and they possess budgets (ranging from \$30 million to \$425 million) that can rival those of Fortune 50 organizations. Plus, they often have a surprisingly free hand with which to operate.

"It's a challenging career move," says Gerry Wethington, president of the National Association of State CIOs (NASCIO). "Because of the economy, states are confronting a whole new set of issues, like business process efficiency, where the private

sector has an opportunity to help."

And public service, whether it's at the federal, state or big city level, teaches CIOs skills that the private sector is finding ever more essential. "Negotiation skills, appropriations, how to work with a legislative body," lists Wethington, who is himself CIO of Missouri. "Many corporations today are stymied by their ignorance of the business processes of government. If and when you go back to the private sector, you'll have a better understanding of how to work with government." Former Washington state CIO Steve Kolodney, long considered a superstar in government IT, is now vice president of digital government initiatives for American Management Systems, a Fairfax, Va., IT consultancy.

## IS THE PUBLIC SECTOR RIGHT FOR YOU?

When states go looking for CIOs, they look for people with highly developed communication skills—managers who can explain technology to everyone from suspicious taxpayers to skeptical legislators, says Dick Bennett, principal at Bennett Associates, a Norwell, Mass., civic recruiter who recently helped the state of Washington fill its vacant CIO post.

State CIOs must be able to pull together massive, far-flung and often poorly integrated operations and must be adept at serving multiple constituencies. And candidates for state CIO have to be goal-oriented: term limits, or the voters, often dictate a short job

### Reader ROI

- Why the public sector is a viable career path
- What skills and qualifications are required for the job
- How public-sector skills are transferable to the private sector



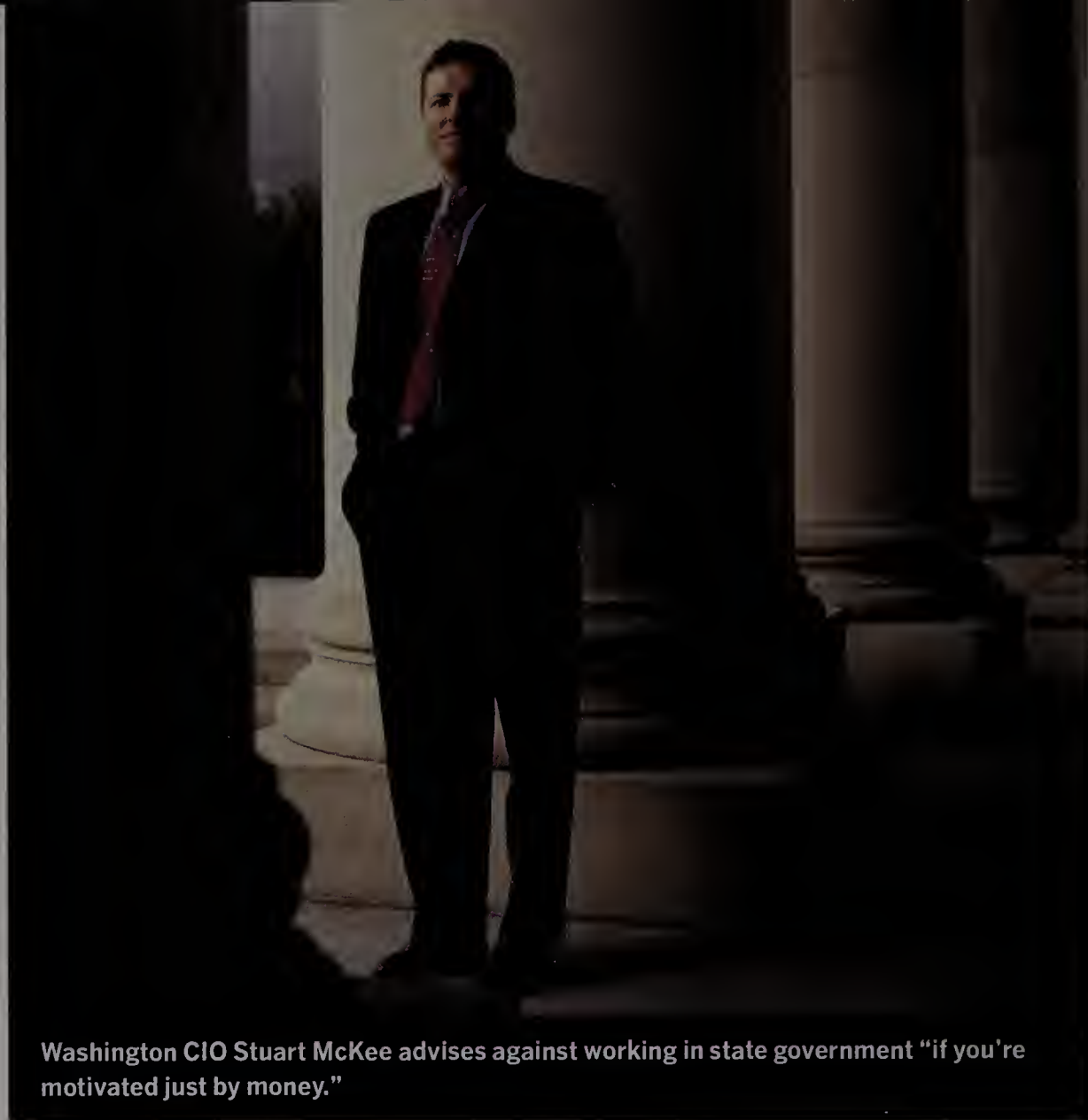
## CIO Role

tenure in which to effect change.

Must the ideal candidate be political as well? Not necessarily. While all but one of the state CIOs we profile knew their governor in some capacity before their appointment, NASCIO's Wethington insists the job isn't so much about Politics with a big "P" as it is about little "p" politics, although he admits it "helps if you're known to the existing IT community in the state, particularly if your company has been in a good private-public relationship with the state government."

But big "P" politics does, in fact, play a big part in the job. In the six weeks it took us to report this story, two of our potential profiles fell by the wayside. Utah CIO Phillip Windley resigned under pressure in December, unable to weather a storm of accusations over what a legislative report deemed were unfair hiring practices. (Windley, a former vice president at Excite@Home, had hired several other Excite employees at higher-than-average starting salaries and had apparently bypassed competitive-practices structures to do so.) And in November, Judith Teller, New Jersey CIO and newly appointed secretary and treasurer of NASCIO, quietly tendered her resignation to Gov. James McGreevey, telling *CIO* only that, "Due to budget and other concerns, it became clear the administration wasn't going to focus on technology as a strategic enterprise asset."

Windley's crash is at least partly about living in a fishbowl; Teller's is partly about pervasive budget crises that are reaching levels last seen during the Great Depression. Both cases highlight the fact that in politics, the CIO job is intimately tied to the successes and failures of the boss, be it the governor, the mayor or the president. (When Teller resigned, New Jersey Gov. McGreevey's approval rating had fallen to 37 percent.) IT is often a difficult sell—inside government or out—and when times get tough, the CIO can suddenly find himself like Harry Potter, living under the administration's stairs. As one CIO says, "If your governor isn't willing or able to expend political capital to gain support for enterprise technology projects, you have to ask yourself what you're doing there." Or,



Washington CIO Stuart McKee advises against working in state government "if you're motivated just by money."

in cases like Windley's, the governor could wind up asking that question of you.

Why jump into such a snake pit? If it's not about the money, and if the future's uncertain, what's the allure of public service? Every CIO we interviewed says a heartfelt belief in the responsibilities of citizenship is an absolute prerequisite for taking on the job.

"The position requires a fundamental belief in the idea of stewardship," says Brian Wolf, CIO for the state of Montana. "If that's not part of your thought process, this is not a job for you."

### WASHINGTON

## STUART McKEE

Director of Washington State Department of Information Services and CIO

**Age:** 36

**Salary:** \$133,000

**Previous job:** Vice president of global Internet operations at Disney

**Took the job in April 2002 because:** McKee was wowed by the state's reputation as an IT leader (he filled the post vacated by CIO superstar Steve Kolodney).

**Technology challenge:** Changing outdated business processes (and convincing people to change along with them).

**Management challenge:** Fulfilling Gov. Gary Locke's directive that the state's IT services be run as a discretionary, competitive business unit within government. "Government agencies and nonprofits buy services from us if they want to. We have a rate schedule; we aggregate demand; we have to prove we're providing the best value. It's absolutely refreshing, and it makes sense for the private sector as well."

**On the pay cut:** "This is a job where your compensation is a matter of public record. You can still be ambitious and work in state government but not if you're motivated just by money."

**His future:** Stay on as long as Locke is in office, or even longer if the new administration wants him to. Beyond that, McKee is convinced he could take his experience with Washington's competitive IT services model and sell it to the private sector. "I love the idea of taking what we do here and bringing that back to private enterprise. I see this position as an amazing career and growth opportunity."

PHOTO BY KAREN MOSCOWITZ



# Get Off the Backup Treadmill

**Sony AIT data storage solutions help companies of any size automate tape backups, delivering real ROI through IT time savings.**

Government regulators are requiring organizations from financial to health care to keep copious long-term records. Disaster recovery and business continuity requirements are more stringent than ever, as organizations try to prepare for the worst. And all the while, IT organizations are stretched to the limit, struggling to meet these basic day-to-day demands.

Clearly, it is imperative for any organization to routinely back up valuable data, but it's not imperative that they spend an inordinate number of IT hours doing it. Let's say it takes a single IT administrator 15 minutes to load, unload and check a backup tape, and that person has to deal with just two tapes each day. That's at least 10 hours of IT time per month spent juggling tapes—hours that could be dedicated to more strategic endeavors.

Automated tape systems can get organizations off the backup treadmill. Such systems allow you to consolidate multiple drives into one solution that can be loaded with enough tapes to handle backups for days or weeks. All the required backups and tape rotations are handled on a predefined schedule, without human intervention.

Once a luxury for only large organizations with big budgets and large IT departments, automated tape storage solutions such as those in the Sony Advanced Intelligent Tape™ (AIT) automation family are now cost-effective solutions for small and midsize organizations. Indeed, the fastest growing segment in the tape automation market is for systems with 20 cartridges or less. Even small companies, workgroups or departments with individual Digital Data Storage® (DDS) tape backup systems can gain significant business benefits. Larger organizations can leverage the performance, capacity and reliability of a Sony AIT library to enable up to 30 days of unattended backup, boosting cartridge utilization and simplifying management.

Traditionally, many organizations use individual tape drives to back up critical servers, adding additional drives as demand dictates. Consequently, these tape drives are often deployed in a decentralized fashion, requiring that someone physically load fresh tapes into each drive daily or weekly, and to verify that backups complete successfully. With data volume doubling or tripling every year or two, it is difficult to keep up as the number of cartridges grows. Before long, multiple administrators are collectively spending an inordinate amount of time swapping tapes and attending to other mundane chores. This is particularly bur-

densome in systems with limited tape cartridge capacity.

While such organizations clearly need an automated tape solution, even those with only one tape drive can benefit. Single-drive tape autoloaders and multiple-drive tape libraries are integrated solutions that have space for anywhere from eight to hundreds or even thousands of tapes, along with a mechanism to automatically replace or rotate the tapes on a preset schedule.

When using an automated solution, an administrator loads the tape drives with the appropriate tapes and uses backup software to specify when tapes should be switched, what files should be backed up and how often. Most systems notify the administrator if something is wrong, such as if a tape runs out of space. Otherwise, the administrator simply needs to check the unit at the end of the cycle, be it seven days or 30, and load new tapes. Consider the time savings compared with manually configuring the backup

terms of storage density per cubic foot.

In addition to rack-mountable storage systems, Sony has desk-side tape libraries that allow users to load up to 15 cartridges in a single removable magazine. This provides enough capacity for two weeks worth of tapes. Sony also offers 30-cartridge units that can provide up to one month or more of hands-free backups.

All of Sony's automated tape libraries include a number of important capabilities and characteristics, including:

- **Remote administration:** Sony's tape libraries all have the capability to be controlled and monitored from a remote location.

- **High reliability:** Sony AIT-3 drives are rated at up to 400,000 hours mean time between failure (MTBF) at 100% duty cycle—far exceeding most other types of traditional backup drives.

- **Fast file access:** Sony drives were the first in the industry to include the Memory in Cassette (MIC) feature, which provides 64K-bit flash memory within the tape cartridge to index information and the location of data on the tape. The feature speeds data access and retrieval, making AIT one of the fastest tape formats in terms of data retrieval.

- **Future growth path:** Currently in its third generation, AIT has a defined and proven roadmap that has seen performance and capacity double with each new generation. In addition, all three generations of AIT drives available today are both read and write backward-compatible.

- **Industry support:** AIT drives work with all major operating systems, including Windows, Linux and Unix, as

well as with the majority of backup software packages, including Computer Associates' CA BrightStor ARCserve, Veritas Software's Veritas Backup Exec and NetBackup, Legato Systems' NetWorker and IBM's Tivoli Storage Manager.

Sony's AIT automated tape backup solutions are also ideally suited to address the growing need for networked backup. Rather than installing and managing dedicated tape drives or libraries near each server, an organization can consolidate all storage functions and back up data from various servers across the network, further reducing deployment complexity and improving IT productivity.

Whatever the configuration, high-speed, high-capacity AIT tape systems can reduce the pressure on your backup window by cutting down on the time it takes to complete a backup or restore. Automating your daily or weekly backups provides even more benefits—more reliable backups performed without manual intervention, freeing up valuable IT hours that can be spent on projects that contribute to the bottom line.

## Progression into Automation

### Single/dual drive library or autoloader



- One or more drives, many tapes
- Excessive manual effort

- Benefits:**
- Higher capacity and performance
  - Hands-off, unattended backup

each day, swapping tapes and making sure each backup is complete. Then, consider that the time savings and increase in reliability are even more dramatic when it comes to retrieving data, when time is even more critical.

### Sony AIT

Sony's AIT tape drives and libraries were designed from the ground up for automation, with a range of models that allow organizations to centralize their backups and upgrade existing library capacity. For example, Sony's LIB81, the first 1U autoloader in the industry, has one tape drive and capacity for eight cartridges. The flexible range of capacities supplied by Sony AIT-1, AIT-2 and AIT-3 tapes offer enough for a week's worth of backups, with room to spare for a head cleaning cartridge or a copy of a previous week's or month's backup tape. Sony's LIB162 is a larger unit with space for two tape drives and up to 16 individual tapes, all within a 2U rack-mountable design that can fit in a limited space. Its storage capacity of 0.8 terabytes (TB) native and 2.08TB compressed puts it among the leaders in

Learn More About

## Sony AIT Solutions

Download the free white paper, "Doing More Through Automation," and learn more about Sony storage solutions. Visit [www.nwfusion.com/sony/AUTO0101](http://www.nwfusion.com/sony/AUTO0101)





**Take-away:** "I didn't anticipate my enthusiasm for public life. Public service 'shareholders' are everywhere, and they care. This is an enormous, enormous IT services operation, and people's lives depend on what we do."

## VIRGINIA GEORGE NEWSTROM

Secretary of Technology

Age: 56

Salary: \$128,000

**Previous job:** Corporate senior vice president and president of EDS Asia

**Took the job in March 2002 because:** "I'd been in the private sector for 28 years. I was getting ready to retire, and I wasn't interested in a government job. But I met with [Gov. Mark Warner], and we talked about the job, and I said, I like what he stands for. I think I can contribute."

**Technology challenge:** Using technology to make government more efficient and effective with an ever-shrinking pool of resources.



Virginia Secretary of Technology George Newstrom (left) believes that what one learns serving in the public sector would make anyone "a better executive in the long run." Montana CIO Brian Wolf (above) says, "I'm working longer and harder than I ever have."

"Downsizing is the same for government as it is for private industry. We're literally going through the same drill, and it's tough."

**Management challenge:** Moving quickly. By law, the governor of Virginia is limited to one four-year term, which gives the administration very little time to implement long-term change. "It requires very quick action. We have to have a direct impact in 18 months. If our plans aren't implemented in, say, 18 to 24 months, we've probably lost our window of opportunity."

**On the pay cut:** "I take dollars out of my wallet every day to pay for this job. It's not a position you take for the stock options or bonuses."

**His future:** Retirement.

**Take-away:** "It would behoove anyone to take a public position, the way executives take on an overseas assignment. The wheels of change may turn at a different pace, but having a working understanding of that process will make you a better executive in the long run."

## MONTANA

### BRIAN WOLF

CIO

Age: 40

Salary: \$105,000

**Previous job:** Manager of telecommunications and technology transfer at Basin Electric Power Co-op, Bismark, N.D.

**Took the job in September 2001 because:** After 19 years with the same company, Wolf welcomed the chance to be Montana's first CIO. Plus, he has a soft spot for Montana; and at midcareer, he was feeling the need to contribute to public good in some manner. So when Montana announced the job, Wolf applied.

**Technology challenge:** Evaluating several large, troubled IT projects to determine whether they're salvageable. And building a process architecture to strengthen the state's project management methodology to ensure that mistakes won't be repeated.

**Management challenge:** Moving the state's IT organization from a siloed environment to an enterprise perspective. "There's a lot of historical culture to deal with, a lot of trust that needs to be built."

**On the pay cut:** "You don't come to these positions for the money. I'm working longer and harder than I ever have. You have to have a fundamental sense of stewardship for the taxpayers of the state."

**His future:** Gov. Judy Martz's term ends December 2004, and she hasn't yet announced if she's running again, but because Wolf does not report directly to the governor it's possible he could stay on under a new administration. If and when he's ready to return to the private sector, "the skill sets I'm using here are absolutely transferable to the private sector or another government job."

**Take-away:** "It's a wonderful feeling when you deploy true efficiency and effectiveness that touches the taxpayer. And the research,

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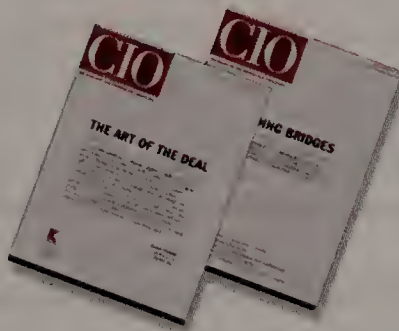
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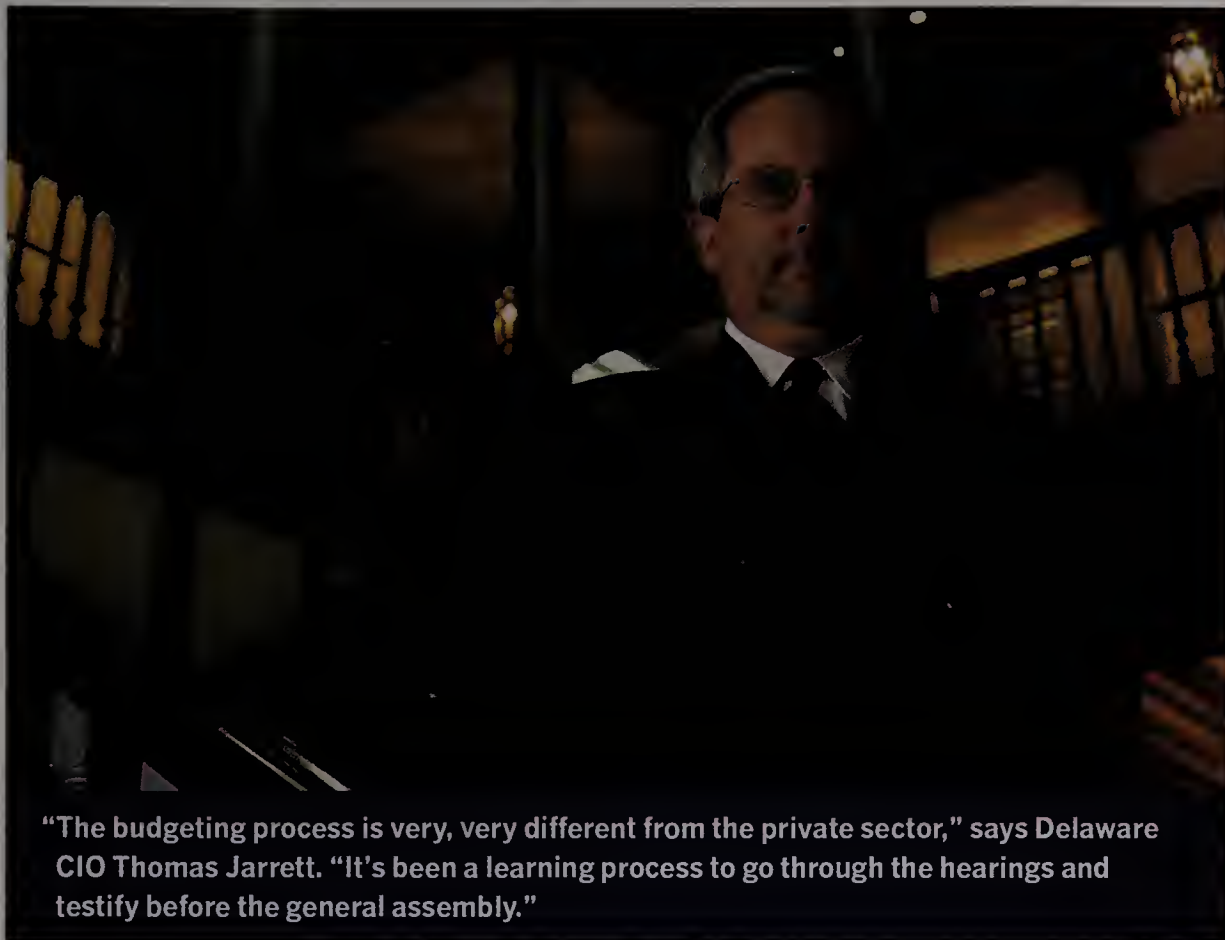
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"The budgeting process is very, very different from the private sector," says Delaware CIO Thomas Jarrett. "It's been a learning process to go through the hearings and testify before the general assembly."

performance management and best practices that come out of government models are invaluable. Wherever I go next, I will be a much better manager because of what I've been exposed to here."

#### DELAWARE

### THOMAS JARRETT

Secretary of the Department of Technology and Information and CIO

Age: 51

Salary: \$133,660

**Previous job:** Worked at Verizon in Delaware for 30 years, holding the position of director of government, education and philanthropy affairs for the last six years.

**Took the job in September 2001 because:** Intrigued by challenge and opportunity. Gov. Ruth Ann Minner, with whom Jarrett had developed a working relationship while he was in Verizon's office for government affairs, won legislative approval in May 2001 to create a new IS organization that would be outside the civil service system. In August 2001, Minner asked Jarrett if he'd be interested in the new cabinet-level CIO position. Jarrett said yes. "I had a chance to come in and handpick and hire an entire

organization with a new market-based compensation plan and run it like a business."

**Technology challenge:** Maintaining critical systems and making data center upgrades while simultaneously building a new organization. And developing standards that provide the highest level of customer service at the lowest possible cost.

**Management challenge:** "The budgeting process is very, very different from the private sector. It's been a learning process to go through the hearings, testify before the general assembly, and figure out the differences between state funding and federal funding, and special funding versus general funding."

**On the pay cut:** "You don't come to these positions for the money."

**His future:** Fulfill his commitment to his governor, including a possible second term, then perhaps retire.

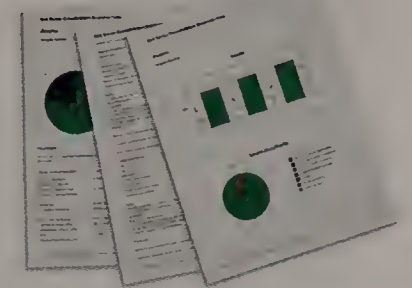
**Take-away:** "This is a great opportunity to hone your communication skills. You're not just talking to people in your company all day. It's the legislature, your peers in state government, agency heads, the press, citizens—a very diverse group of people." **CIO**

Tracy Mayor is a freelance writer who covers technology for *CIO*. Send comments to [letters@cio.com](mailto:letters@cio.com).

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Leadership and Management  
Editor Edward Prewitt at  
[hotseat@cio.com](mailto:hotseat@cio.com).

## Walk the Alignment Tightrope

*CIOs need a light touch to set business managers' expectations about IT projects—and still appear helpful*

BY MERIDITH LEVINSON

At Hon Industries, a furniture and hearth manufacturer based smack in the middle of America—Muscatine, Iowa—Malcolm Fields walks a fine line when setting expectations with his business colleagues on what IT projects can accomplish. For Fields, vice president and CIO of the \$1.7 billion company, that balancing act means showing them the challenges of implementing new technology without coming off as a naysayer or know-it-all.

The 41-year-old executive continually works to set, reset and communicate expectations on the length and cost of an IT project, the challenges that might arise during its course, and the new technology's true functionality. Not doing so can lead to project failures, wasted resources, additional costs, lost opportunities and a loss of respect. "If you waste a half-million bucks [on a failed implementation], you have to take a one-time hit to your [financial] reporting, and that's ugly," says Fields. "You lose credibility with the street."

Botched projects damage reputations and can ultimately damage careers. "CIOs are terminated not because they're not strategic but because they don't deliver," says Louis Boyle, vice president of the Executive Directions group at Meta Group. "Job number one is to deliver, and that means delivering on expectations."

Setting user expectations—neither promising too much nor offering too little—is one of the trickiest aspects of the CIO's job, Boyle says. Those who do make the effort to communicate expectations risk appearing arrogant or difficult to work with, particularly if the users view the advice as the CIO's intransigence to give users what they want.

Fields warns that "if you sound negative and if what [users] hear from you is 'He's too busy, he doesn't want to deal with this problem,' they're going to do it anyway"—by purchasing software they've read about, for example, regardless of whether it's the best solution.



**Hon Industries CIO Malcolm Fields set executive expectations for CRM by explaining the causes of its high failure rate.**

Helping users understand what they're getting into and then helping them succeed at it is of paramount importance. At the same time, the Kansas-born, Iowa-bred Fields doesn't want to seem too big for his britches. So when he caught wind of a business VP's interest in CRM, Fields knew he had to act fast and act with class.

### Time for the Full-Court Press

Sitting in strategic-planning meetings where corporate executives discussed



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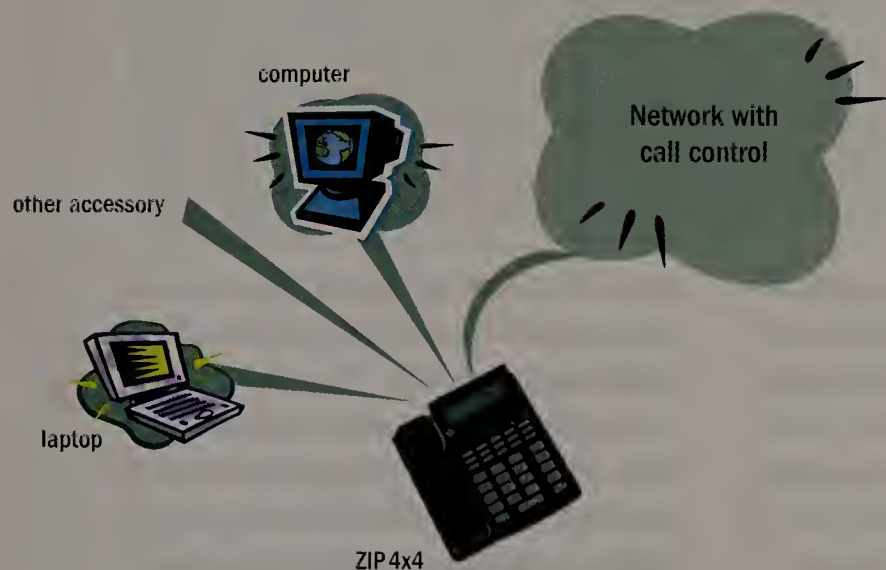
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# Hot Seat

their technology needs, Fields knew the day would come when his colleagues in sales would ask for a customer relationship management system—and he dreaded it. “Consultants will tell you 50 percent of CRM projects fail. I’d say it’s 75 percent,” says Fields.

In March 2002, Kevin Jordan, vice president of corporate accounts for All-steel, one of Hon Industries’ furniture manufacturing businesses, went to the IT department with a proposal. He told Ralph See, an IT project manager with whom Jordan had a working relationship, that he could improve the efficiency of his field sales employees if they had more tools to communicate with each other and with corporate headquarters. He wanted IT’s help in looking for a solution that would integrate with the rest of the company’s business systems. Jordan was obviously under the impression that finding and implementing a comprehensive, off-the-shelf contact management system would be simple.

Within a few days, Fields heard about their meeting and decided he better get involved. He knew he needed to make Jordan understand what it takes to successfully pull off a CRM project.

First, Fields needed to show Jordan the reasons behind CRM’s high failure rate: The scope of these projects easily and frequently explodes; the products, with their bells and whistles, are too complicated and difficult for field salespeople to use; and the logistics of getting software installed and synchronized on every field sales employees’ laptop is too complex.

Fields and See began by giving Jordan

copies of articles about CRM projects so that he could read for himself the difficulties companies face when implementing such systems. They also attended meetings that Jordan set up with vendors.

“I went to every meeting until I saw in Kevin Jordan’s eyes how damn hard this was going to be,” says Fields. Every time the software salesmen began crowing about their products’ special features,

cally fail,’ I basically asked each vendor what their success rate was,” says Fields. This way, Fields says, he didn’t have to worry about insulting Jordan’s intelligence or appearing negative or confrontational.

Jordan was able to ask informed, pointed questions because he had read the articles provided by Fields. With vendors’ sobering pronouncements about their success rates, Jordan soon realized

## SETTING BUSINESS EXEC’S EXPECTATIONS

### Six Steps for Defining Project Success

CIOS USUALLY NEGLECT to align their expectations of an IT project with those of users, says Thomas Hollman, an organizational psychologist with Mainsail Associates in Princeton, N.J. The result can be different definitions of what constitutes a successful project. Here are six tips for sidestepping that snare.

- 1. Don’t go it alone.** Determine the needs and requirements of your business colleagues, and strike a balance between what they want and what your IT department can deliver.
- 2. Design mock-up screens** to show the business unit leaders what you’re thinking. Solicit their feedback on what you’re showing them.
- 3. Link your expectations** for the project to your company’s mission. Show your internal customers how simplifying an IT project will increase productivity, lower costs or improve quality or customer service.
- 4. Distribute frequent status reports** to keep important stakeholders in the loop on a project’s progress.
- 5. Educate users** on what it takes to implement a particular application or system.
- 6. Consider writing service-level agreements** with internal customers to establish mutually agreed-upon expectations.

—M.L.

which likely would have unrealistically raised Jordan’s expectations for the products’ functionality, Fields gently reminded the vendors how difficult these projects are. He also asked each vendor point-blank what its success rate was. All the vendors fessed up to a 50 percent to 70 percent failure rate.

“Instead of me saying, ‘Kevin, these projects are very difficult and they typi-

what he was getting into. In fact, he was ready to can the CRM software project altogether, says Fields.

Knowing the software was something the business needed, however, Fields and his project manager quickly set out to help Jordan establish parameters for the project and the software’s functionality. In one-on-one conversations, See asked Jordan what functionality he really needed, ad-

**CIO.COM** To read more on **MANAGING EXPECTATIONS** and for a different take on **360-DEGREE FEEDBACK**, go to [www.cio.com/printlinks](http://www.cio.com/printlinks).



vised him on the importance of limiting a project's scope, and cautioned him against getting caught up in all the "fluff" vendors showed off during demonstrations.

Fields says it wasn't hard to sell Jordan on the idea of simplifying the project. Since 1992, the company has adhered to a business philosophy it calls "rapid continuous improvement" that emphasizes streamlining design, manufacturing and administrative processes to increase productivity, lower manufacturing costs and improve product quality. "We're all about simplification," says Fields of Hon. "It's something that people take to very easily."

### The Importance of Being Earnest

In setting expectations, Fields advises other CIOs to deal with their peers in person. "Get to know these people. Understand what they want and what they need. Get involved in a conversation. Work in your points. Find data to back up your points," he says. "You've got to get to know these people. They've got to know what your motivation is. They've got to know you want the project to work just as badly as they want it to or more so, but you want them to know how difficult it's going to be."

Project manager See worked with Jordan to develop a system mock-up, complete with screen fields for entering information. He explained the application's look and feel to Jordan and asked for his feedback. From his conversations with Fields and See, Jordan could clearly articulate his specific requirements to vendors and find a vendor that could come the closest to matching what he wanted.

For his part, Jordan says he appreciated Fields's approach to setting expectations. "He listens, then makes a qualified statement based on information rather than prejudging the outcome," says Jordan. "I never once thought he was imposing his will on the outcome of the project."

Jordan also appreciated Fields's constructive approach to laying out the chal-

## MANAGEMENT REPORTS

# Working with CXOs

### How to Lead as a Team

Three-fourths of CIOs sit on their companies' executive teams, according to this magazine's "State of the CIO 2003" survey (see the results at [www.cio.com/state](http://www.cio.com/state)). But do those teams know how to lead as a team?

According to Accenture researcher Robert J. Thomas, few executives excel at working in tandem with their peers on leadership teams—that is, collaborating on complex decisions, engaging in a productive dialogue (in which opposing opinions are discussed rather than repressed), and then leading change as a cohesive group across multiple business divisions or functions. In many hierarchical organizations, "leaders have deep functional or regional strengths

and personal histories that predispose them to think in terms of the parts rather than the whole," writes Thomas, a senior research fellow at the Accenture Institute for Strategic Change, in a recently released report, "Leading as a Team."

Meetings at companies without these leadership skills can consist of executives updating one another with their different perspectives rather than thinking as an aligned group. CIOs falling into this trap, for example, tend to view situations in terms of the impact on IT, or IT's potential for having an impact, rather than considering the business as a whole.

In contrast, Thomas says, manage-

ment teams that have learned to truly act as one group display several distinctive abilities, such as:

- They make decisions that stick.
- They model the collaboration they want others in the organization to exhibit.
- They differentiate the issues or decisions that call for a cross-functional approach from the ones that are best delegated to a single unit or function (for example,

where one division has expertise that others lack).

Thomas outlines several steps that executive teams should take toward working together better. Managers can begin by taking a hardheaded look at how well, or poorly, they collaborate.

They may need to

learn new skills, such as how to make decisions collectively.

One large automotive company that Thomas studied came up with several unconventional metrics to track its progress toward leading as a team. These measures revealed an increase in employee enthusiasm and a changing proportion of cross-functional and global issues on the team's agenda.

"Chances are, your company will face increasing complexity in the coming years," writes Thomas. "In such an environment, senior management's ability to work effectively as a team could mean the difference between extinction and survival."

—Edward Prewitt





## Hot Seat

lenges of the project. "Instead of saying, 'We can't do this,' [Fields] said, 'These are the stumbling blocks we've got to get past.

Here are my ideas on how we can get past them. What do you think? What do you need us to do?'" says Jordan.

Jordan recently selected a vendor, which he declined to name. The system went live in mid-February and took only eight weeks from management approval to rollout. Fields believes the time he took to get Jordan to understand the challenges of implementing CRM software paid off when they jointly sold the project to the executive committee.

**"Business managers have got to know you want the project to work just as badly as they want it to or more so, but you want them to know how difficult it's going to be."**

—Malcolm Fields, CIO, Hon Industries

"My role as CIO is to ensure that the projects we invest in turn out to be successful. The best way to do that is to make sure the people who get involved understand the true risk and the true [total cost of ownership] so nothing comes back to bite them," says Fields. And properly setting expectations reduces the risk that users will come back and bite the CIO. **CIO**

Have you found that setting expectations on IT projects is a minefield? Let us know at [hotseat@cio.com](mailto:hotseat@cio.com). Senior Writer Meridith Levinson can be reached at [mlevinson@cio.com](mailto:mlevinson@cio.com).

**Leadership Agenda** BY SUSAN H. CRAMM

# An All-Around Waste of Time

*Full-circle or 360-degree feedback assessments must meet three conditions to be useful: tailored, internalized and followed up*



For a manager, giving an employee tough feedback can truly be a case of "This hurts me more than it hurts you." Managers harbor doubts about whether their feedback is completely balanced. They wonder how they can help employees move beyond denial to acceptance and accountability for adopting new behaviors and developing new skills. The 360-degree or full-circle assessment from

peers, direct reports, subordinates and supervisors can address these concerns. This kind of assessment has proven pivotal in many careers.

But 360-degree assessments can also be an all-around waste of time. Many well-intentioned assessment programs have fallen short of their potential because of poor design and execution. In my experience, 360s can be a catalyst for changing behaviors if three conditions are met. First, the survey needs to be tailored to the employee—a one-size-fits-all approach does not apply. Second, the survey recipient has to have ears that want to hear. This also requires a supportive organizational climate in which everyone is seen as a work-in-progress. The employee must be able to control the 360 process rather than the other way around. Finally, feedback recipients need significant follow-up support to fuel and guide their development over time.

**TAILOR THE SURVEY.** A review of an employee's leadership ability is not much use if this person is struggling with interpersonal issues. Take the case of an IT executive in financial services who participated in a companywide 360-degree program. The results were of little benefit to her since the questions focused on cultural fit and basic management competencies—areas in which she scored very high, in general. Given that she was relatively new to the executive ranks, she would have benefited much more from an assessment that measured the broader aspects of executive effectiveness, with specific attention paid to IT.

Another dimension of survey relevance is how the data is captured and shared. Research indicates that "ratings by themselves don't yield the detailed, qualitative comments and insights that can help a colleague improve performance," and "without specific comments, recipients are left with no information to act on and with little sense of what might help them get better at their jobs" (from Maury A. Peiperl's *Harvard Business Review* article "Getting 360-Degree Feedback Right").

**READY THE EARS.** Benefiting from a 360-degree assessment is all about being psychologically ready to hear and act on the results. Although the prospect of a 360 is scary for many, they don't resist because the prospect of overhearing what others are saying is too tantalizing. But don't confuse willing-



ness to participate with readiness to change. Consider the executive who was given feedback that he used his political and relationship skills to sidestep responsibility. This person took no action. The feedback fell on deaf ears because he hadn't asked for it and didn't believe he needed it.

You can create a climate in which 360 feedback is positively received by openly sharing your own strengths and development opportunities, by ensuring that frequent on-the-spot coaching is the norm, and by giving participants control over certain aspects of the 360-degree assessment process (such as timing, survey selection, participants, confidentiality and action plans).

**BEGIN AT THE END.** Someone once said that life is 10 percent what happens to you and 90 percent how you react to it. When a person receives 360-degree feedback, the assessment process is only about 10 percent complete. The heavy lifting of modifying behavior still lies ahead. To appreciate the amount of support necessary to break old habits and adopt new ones, ask yourself whether your latest physical fitness assessment was all you needed to become new and improved and lean and mean. Many of us have discovered that only through the use of a personal trainer are we able to focus on our goals for the time it takes to realize results.

At the office, you can support the change process by providing a coach or mentor—inside or outside the organization—for a minimum of two hours a week for three to six months. If the ears are ready to hear, a coach will help fuel behavior change by reinforcing the elements of accountability, intellectual honesty, time management, skill-building and encouragement.

As an executive coach, I don't recommend 360s across the board. There are plenty of other ways to gain insights

about people's strengths and development opportunities. The valuable instrument of full-circle assessments is too often trivialized, so it has the same impact as the 30-question magazine quiz that is taken for distraction and amusement but is never taken seriously.

## Reader Q&A

*Susan H. Cramm answers questions on "An All-Around Waste of Time"*

**Q: Most 360 programs are anonymous. To me, that makes them useless.**

**Moreover, most people tend to focus on weaknesses. How about a program focused on identifying and leveraging strengths and ignoring weaknesses?**

**A:** I disagree that anonymous feedback is useless and that a focus solely on strengths will help improve effectiveness. When reviewing the results of a 360, both strengths and development opportunities (weakness is such a pessimistic term) should be identified. The strengths allow people to understand their unique gifts—attitudes, skills and behaviors—on which they can build their careers. The development opportunities allow people to mitigate behaviors that may derail their career development over time. For example, a technologist who is rated only highly but not excellent for his ability to deliver results benefits from knowing that people find him difficult to work with, especially if he is interested in assuming leadership positions in the future. This is an important point—strengths and development opportunities should be evaluated in light of career goals.

Regarding the value of anonymity, a 360 participant should focus on the top five strengths and development opportunities and forget the rest. Consensus makes the issue of anonymity irrele-

vant, while the higher-quality feedback from anonymity makes it a prerequisite for success with a 360.

**Q: I tried the 360 tool for teachers in the management department. Two issues confront me:**

- 1. How to address conflicting reports?**
- 2. How to follow up on the results of the program?**

**A:** The conflicting nature of the feedback is one of the strengths of the 360 process. Performance effectiveness is definitely in the eye of the beholder, and the 360 process must be designed not only to highlight conflicting reports but also to provide insights on the source of the conflicts. The best practice is for the 360 design to incorporate qualitative comments as well as quantitative ratings. An experienced professional should assist in the interpretation of the results and provide follow-up development coaching. The only way to judge the effectiveness of a 360 program is to repeat the survey every year or so as part of a long-term commitment.

**Q: What do you think about assessments being tied to salary?**

**A:** Tying the results of 360s to salary can be a very effective way of putting your money where your mouth is, provided the survey is well designed along the dimensions I've outlined. To ensure that the kinks are worked out in the design of the 360, most experts recommend initially implementing it for developmental purposes and delaying the linkage to incentive systems until the assessments are well accepted and understood—by all participants. 

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To see more reader questions and answers from Susan H. Cramm, go to [www.cio.com/leadership/agenda.html](http://www.cio.com/leadership/agenda.html). Cramm is president of Valuedance, an executive coaching firm based in San Clemente, Calif. Her e-mail address is [scramm@cox.net](mailto:scramm@cox.net).



# Emerging technology

INNOVATION and PRODUCTS in the VANGUARD

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## Sleuthing Out Data

*Categorization software helps search-tool users find what they seek*

BY FRED HAPGOOD

*Edited by Christopher Lindquist. Send your thoughts and ideas for future columns to [clindquist@cio.com](mailto:clindquist@cio.com).*

**MORE AND MORE**, the problems that earn CIOs their paychecks revolve around making it easier for users to explore huge volumes of data. They do this through finding known objects in huge search spaces, assembling top-down overviews

that summarize the important points of a topic, and helping searchers decide what they really want when their initial search ideas are confused, misguided or ambiguous.

At one time, researchers speculated that

Search tools...Nanotech microbes...Videoconferencing



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## Finder's Keepers

**Technology** Categorization software

**Anticipated benefit** Categorization historically has been a manual process; new tools allow companies to automatically place data into categories, reducing costs and increasing productivity as users find necessary information more easily.

**Hurdles** Categorization technology is still new and can involve considerable up-front effort and time (as much as several weeks) to establish necessary rules for categorization.

### Vendors

#### Applied Semantics

([www.appliedsemantics.com](http://www.appliedsemantics.com)): Concept Server, a semantics-based categorization tool, plus products specific to editorial and advertising markets

#### Autonomy

([www.autonomy.com](http://www.autonomy.com)): Idol Server, automatic classification tools plus portlets, portals and other products

#### Endeca Technologies

([www.endeca.com](http://www.endeca.com)): Guided ProFind tools for both search and data navigation

#### GammaSite

([www.gammasite.com](http://www.gammasite.com)): Semantics-based automatic categorization and tagging software

#### iPhrase Technologies

([www.iphase.com](http://www.iphase.com)): Categorization and search tools targeting the self-service markets

#### Mercado Software

([www.mercado.com](http://www.mercado.com)): IntuiFind search-and-browse-based navigation tools

#### Verity

([www.verity.com](http://www.verity.com)): Wide variety of search tools, including automatic categorization features in products such as K2

solving such search problems might require artificial intelligence: systems that simulated human thought and could behave like skilled reference librarians. But there is an easier solution—ordering data into categories and subcategories and then having users interact with that structure before looking at the raw results. Consider a hungry New Yorker looking for a place to eat. A search under “New York AND restaurant” that returned only a list of actual eateries would be too long. On the other hand, if the results came packaged in an easy-to-scan collection of restaurant types—Italian, French, Asian and, if necessary, subtypes under that: Korean, Japanese, Vietnamese and so on—the whole set of New York restaurants suddenly becomes navigable.

Categorization also helps with other issues. It solves the overview problem by formatting different categories (restaurant types, locations, price ranges, ratings) side by side, presenting the searcher with a multifaceted, top-down perspective. The same formatting trick helps searchers who don't quite know what they want by letting them examine query results from several angles at once, interactively.

Category trees are not new. Until recently, however, IT applications required paid humans to think up the category names, define their relationships and write

in the sophistication of enterprise-level search engines and the number and kinds of users a system can help.

These systems, however, are not exactly plug and play (at least today) and may require significant time to establish rules that ultimately create the final categories. But with proper investment, autocategorization tools can reap significant benefits.

## Parsing Parts

In 2000, components distributor Arrow Electronics built and started to sell subscriptions to Ubiquidata, a components database made up of information about more than 23 million items, each with as many as 50 related data elements. The company initially marketed the product to purchasing and material planning professionals within original equipment manufacturers (OEMs). For clients such as those, searching the huge data set was no problem, since they usually knew exactly what they were after, often right down to the manufacturer's part number.

Arrow, however, wanted to bring the service to another group: design engineers. Unlike line managers, designers seldom know what they are looking for ahead of time. They start with a wish list of properties for the perfect part, filter out candidates that come close but not close enough, and then find the best compro-

## More and more information travels with a lengthening entourage of data about itself. Autocategorization software recognizes and leverages that data.

the rules that channeled data into the proper boxes. As a result, the technique was limited to fields with big budgets, such as financial analysis or defense. During the past few years, however, several developments have made it much easier to automate or at least semiautomate categorization, sparking a small revolution

mise by carefully comparing the remaining parts and fine-tuning their design. The very last thing they learn is the part number. Customers such as those require a very different set of searching tools.

In response, Arrow struck up a partnership with Endeca Technologies, a startup search vendor that specializes in



“query discovery” software—searches that use the experience of navigating around, through and over complex category landscapes to help searchers figure out what they want.

After a development phase of about six months, the search application was ready for the design engineers. Today a user searching the Arrow database can organize results by several interacting categories. For instance, suppose she is looking at the *power*, *size* and *price* categories, and she clicks on a specific range of power (say, 10 to 20 watts). The listings in the *size* and *price* categories then automati-

things changed for the better. “Today we’re increasingly relying on the software to do category recommendations,” Lundstrom says. “Everybody can see that it recognizes more relationships and that it isn’t biased.” And Lundstrom got his developer back, which made the CIO happiest of all.

U.S. Robotics (USR) is hoping to extract efficiencies from a different source. “We make a low-margin product,” says IT Director Steve Kossel. “One call to our support desk wipes out our profit on that sale.” Surveys show that 90 percent of users calling technical support had visited the USR website before calling. While the

Raymond Karrenbauer, CTO of ING Americas’ Technology Management Office, reports a fourth payoff: Automatic categorization and taxonomy makes it easier for a company to add uncategorized or weakly categorized material, such as e-mail messages or ING’s more than 40,000 different formats of unstructured data, to its searchable data space. He adds that categorization improves the work of internal users—allowing customer service reps, for instance, to find what they need faster.

Several trends have combined to make those new services possible. First, two relevant “natural language recognition” technologies have matured almost simultaneously. One maps the frequencies of words in a document and their positions relative to each other to generate a document profile. The software then compares that profile with the profiles of previously categorized reference documents, those of other new documents or both. The first comparison sorts new documents into established categories; the second recognizes new topical “clusters” that probably should be explicit categories. For instance, if two documents have *China* and *ceramics* within 10 words of each other, the odds that they should be in the same category go up. Autonomy’s product relies on that approach.

The second technique (the one used by Applied Semantics, Inquiria and others) relies on semantics. Given a document, such a program first filters out the important words, then looks up their synonyms, meanings and their thematic relationships (for example, the term *chair* would be linked to *furniture* and *rocking*). Finally it counts the number of these relationships to decide which words are most likely to reflect the document’s major and minor themes. Theoretically such a system can figure out whether an article on *chips*

## Smart searching might very well become as important to the face of an enterprise as smart salespeople.

cally change to present just the sizing and pricing of the parts in the desired power range.

The new service started in June 2002, and its success has allowed Arrow to change Ubiquidata’s licensing model from seats to sites, says Chris Henry, Arrow’s vice president and global information business unit general manager. In other words, the database’s ease of use finds that enterprises now prefer to let anyone in the company—not just specific individuals—log on and poke around.

### The Politics of Searching

Automatic categorization can do more than just expand markets. “It’s difficult for anyone to understand who hasn’t lived through it to appreciate how political categorization management is,” observes Scott Lundstrom, CIO of AMR Research. “We had a category nomination process. We had a category retirement process. They all required long meetings.” Maintaining and supervising a process consumed a full-time IT position.

Then AMR moved to an autocategorizing product from Autonomy, and

jury is still out on USR’s experiment with autocategorization (using tools from iPhrase Technologies), Kossel believes that the products will improve the precision and responsiveness of support on the USR website sufficiently to cut the number of support calls by a third, saving the company more than \$135,000 a month.

Even companies that can afford manual tagging have reasons to look at autocategorization. Chat Joglekar, business development manager at USAToday.com, says that the major benefit of autocategorization for his company is consistency. USAToday.com had long used editors to do manual categorizing—or had avoided categorization altogether. But as the sheer mass of online material and the total number of editors kept growing and changing, the slight idiosyncrasies in how each of them categorized information steadily degraded the search function’s performance. Now the online newspaper takes advantage of a product called Concept Server from Applied Semantics. While machines may have their peculiarities, at least their biases are consistent over both time and scale of operation.

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belongs under food, gambling, computers or horses, even if none of those specific terms appears in the document.

Perhaps the best news for vendors designing autocategorization products, however, has nothing to do with research breakthroughs. Today, more and more information travels with a lengthening entourage of data about itself (such as e-mail headers or meta-tags in webpages). Autocategorization software can recognize and leverage that data for its own ends. For example, iPhrase Technologies specializes in finding and harvesting, or "spidering," categorization information across many data types. "Three to four years ago, we had to code up explicit structure with every deployment," says Senior Product Manager Roy Rodenstein. "But today our clients have much richer data."

All those trends have made autocategorization, and therefore smarter searching tools, a bright spot in today's IT scene. Many companies have entered the sector. Some, such as Endeca or Mercado Software, specialize in the display and management of the categories that users see and interact with. Others, such as Applied Semantics, Autonomy and GammaSite, focus on the back end: looking at input documents and creating the meta-data the display tools need in order to work. Another set of companies, including long-time search player Verity, does both.

There's no sign that advances in categorization and search technology will slow down anytime soon either. If searching is the foundation of all our relations with the online data, and categorization is the foundation of intelligent searching, then it seems likely that CIOs are going to be boosting the IQ of their searching tools for some time to come. Smart searching might very well become as important to the face of an enterprise as smart salespeople. ■

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Fred Hapgood is a freelance writer based in Boston. He can be reached for comments at [hapgood@pobox.com](mailto:hapgood@pobox.com).



#### **UNDER DEVELOPMENT** **Nanotech**

## **Bubbling Up Nanostructures**

**NEARLY BOILING**, acidic hot springs could lead to the creation of electronic components that are 10 to 100 times smaller than today's smallest parts.

While exploring extreme environments similar to those that might exist on other planets, scientists at the NASA Ames Research Center investigated natural hot springs. While experimenting with microbes that live in the springs, researchers discovered that modified proteins taken from the organisms could be used to grow meshlike "nanostructures."

By manipulating the DNA in the *Sulfolobus shibatae* protein, the researchers were able to create proteins that self-assemble into a tiny, two-dimensional lattice capable of capturing metal and semiconductor material particles at specific locations.

Creating large quantities of the modified protein is relatively easy. The researchers clone the gene coding for the protein into rapidly multiplying *E. coli* bacteria and then brew the mixture inside a vat. The high temperature process doesn't affect the protein—which is accustomed to living in a hellish environment—yet it safely destroys nearly all the proteins from the nasty *E. coli* bug.

The *Sulfolobus* protein self-assembles into rings that are about 5,000 times thinner than a human hair. These then associate into a honeycomblike lattice that is applied to a silicon wafer substrate and then blanketed with a gold or semiconductor slurry of particles. "The particles that stick to the structure are 'quantum dots' that are about one to 10 nanometers across," says Andrew McMillan, the project's coinvestigator. Current computer chips contain features that are approximately 130 nanometers apart.

"With further refinement, the nanostructures could someday serve as computer memory, a sensor or a logic device," says McMillan. First, however, researchers must find a way to develop large numbers of protein-based circuits at a competitive price. But the raw material is cheap and the size benefits substantial, so that shouldn't be a big problem. "The obstacles seem surmountable," says Jonathan Trent, the research project's principal investigator.

—John Edwards



## COMPANY TO WATCH

Polycom

# Unified Conferencing

*Polycom eliminates connection boundaries to distance conferencing*

BY DEBBY YOUNG

**YOU'D PROBABLY RECOGNIZE** Polycom's famous tri-corner speaker phones, the gray communicators that crouch on conference room tables around the world. But now the company is looking to take islands of conferencing technology—audio, video and Web collaboration—and unify them into a conferencing experience that lets anyone join in at anytime, from anywhere and via any network connection.

Two of Polycom's customers—manufacturing conglomerate W.R. Grace and Barton Malow, a \$1.2 billion construction company—are already taking advantage of this converging conferencing technology to spur growth and significantly cut operating costs.

"We're using Polycom's WebOffice internally to facilitate working sessions among remote teams and have also started using the technology with our customers for troubleshooting and engineering collaboration," says Guy Welty, manager of global media networks and collaborative services for W.R. Grace.

For example, W.R. Grace content experts can use Polycom technology to present information to as many as 30 customers at once, speeding interaction with the customer and saving the experts travel time. It's also easy to set up last-minute meetings. The company cut more than \$1 million in travel costs because of the unified conferencing technology. By bringing Web casting and audio bridging in-house, Welty estimates that the company saves another \$700,000 annually in fees that would otherwise go to service providers such as AT&T, WebEx Communications and Yahoo.

## Polycom

**Headquarters** Pleasanton, Calif.

**Founded** 1990

**Employees** Approximately 1,200

**Revenue** \$383.2 million

**Products** Polycom Office, which includes SoundStation for teleconferencing, WebOffice for Web collaboration, ViewStation for videoconferencing, iPower for video collaboration

**Reason to watch** Unified conferencing technology provides a platform for seamless teleconferencing and videoconferencing integrated with Web collaboration

**Hurdles** Overcoming pricing barriers that have limited investments in conferencing technology to the boardroom instead of mainstream business communication

**Website** [www.polycom.com](http://www.polycom.com)

Barton Malow's CIO, Phil Go, says Polycom's iPower system has enhanced his company's ability to share applications and documents during a video call. "The ability to walk into a room, hit dial to connect with colleagues, and then simply plug in a laptop to easily share content and work together as if everyone was in the same location is huge," says Go.

The videoconferencing industry needs to move into this unified messaging space to sustain the growth it's seen during the past two years, says Gerry Kaufhold, principal analyst for multimedia and broadband at research company In-Stat/MDR. With war, terrorism and high fuel costs, the business climate is

primed for a travel-free form of communication. "Having Polycom get into this space is just a really good sign," says Kaufhold.

While he believes there's plenty of opportunity for everyone to benefit in this arena—manufacturers and service providers alike—Elliot Gold, president of research company Telespan, raises a cautionary flag. Microsoft recently acquired remote collaboration provider Placeware and will begin bundling unified messaging with its Office 15 product. "This will allow users of Microsoft Office to do many of the things Polycom WebOffice offers, in particular online collaboration through documents, graphics, and even video and voice," says Gold. "And with Placeware technology added to the mix, the new Office 15 will allow ad hoc, real-time, virtual meetings." Microsoft has the potential, he thinks, to steamroll over everyone.

WebEx is also promoting its tools well, notes Gold. But Kaufhold says that Polycom and WebEx might be beneficial to one another—opening up opportunities for multiple technologies to enhance collaboration. Kaufhold sees high-end competitors—such as Tandberg and Sony's Video Conferencing Group, as well as unified messaging software vendors such as Forgent Networks—carving a niche for themselves in the unified conferencing space. "We think the worldwide market for the technology will grow to more than \$2.2 billion during 2006," says Kaufhold.

He feels that if Polycom can bring its technology from the corporate boardroom to the department meeting room, it will make significant inroads into mainstream business communications. But that will mean price cuts. According to Barton Malow's Go, a unified conferencing system currently runs his company as much as \$50,000. But he predicts that competitive pressure and technological innovations will drop Polycom's per-unit price to the \$10,000 range. When that happens, he says, "Nothing would please me more than having a unit in every job site." **CIO**





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# EXECUTIVE Summaries

May 1, 2003

## COVER STORY Portfolio Management

By Todd Datz | 56

**S**eventy-five percent of IT organizations maintain little oversight over their project portfolio and have nonrepeatable, chaotic planning processes in place. To avoid squandering scarce IT dollars, companies need an effective IT portfolio management process that takes a holistic view. In a portfolio approach, proposals are categorized, evaluated and vetted by IT and business leaders who match projects against strategic objectives. Though portfolio models vary among experienced portfolio management advocates, such as DHL, Eli Lilly and Merrill Lynch, they share underlying best practices. It begins with gathering a detailed inventory of all projects in the company, ideally in a single database. For successful prioritization, projects should be separated by type into a few categories to facilitate comparison. Each project under consideration must have a business case showing estimated cost, ROI, business benefit, risk assessment and how the project ties into the company's strategic objectives. Portfolio management requires continuous monitoring to update project status and flag troubled initiatives, and the portfolio needs periodic adjustment for changing market conditions and strategic priorities.

**"When we started this, the IT people were proposing the projects. Now the businesspeople propose the projects and take responsibility for timeliness of delivery."**

—MARVIN BALLIET, CFO, MERRILL LYNCH GLOBAL TECHNOLOGY AND SERVICES

## IT Staff Stress

By Stephanie Overby | 72

**A PERFECT STORM OF FORCES**—the economic malaise, reductions in IT workforce, changes in company leadership and an increase in outsourcing—has led to unprecedented IT staff stress levels, according to new CIO research. Despite the forbidding job market, if CIOs don't do something now, their best workers will leave and organizations will suffer costs related to absenteeism and productivity decreases among those who remain. CIOs can do battle on behalf of their staffs by using project management and governance to prioritize and limit the number of projects, and to give employees more control and accountability. Honest communication is critical; when outsourcing looms, address employee concerns that in-house developers will become obsolete by offering them opportunities to learn systems analysis and gain more strategic skills. And to stave off burnout, give IT employees time each week to devote to strategic work rather than the immediate tasks at hand.

## ASP Comeback

By Meridith Levinson | 88

**IT MAY BE TIME FOR CIOs** to get over their (not unfounded) aversion to application service providers. In the CRM space, ASPs are an increasingly viable solution, particularly for small and mid-size companies. For enterprises from British Airways to Briggs & Stratton, going with a hosted CRM or sales-force automation solution turned out to be easier and less costly than deploying a licensed enterprise software package. After verifying sound security practices and vendor viability, the companies took five months on average to roll out their ASP applications. CIOs found vendors bending over backward to accommodate greater support levels and customization. ASP customers don't have the capital expenses associated with purchasing infrastructure, but they must pay the monthly service fee, which makes the long-term cost savings only about 25 percent, according to one analyst.

## Public-Sector CIOs

By Tracy Mayor | 94

**IN THE PAST 18 MONTHS**, more top-flight CIOs from corporate powerhouses have been saying yes to jobs in the public sector. Their motivation, surprisingly, isn't post-9/11 altruism or disgust with corporate financial scandals but old-fashioned careerism. Being a public-sector CIO—be it state or major municipality—can be both a great job and a great investment in the future. Although the pay can be 70 percent lower than at a comparable private-sector organization, state CIO positions offer wide-ranging authority, a surprisingly free hand to creatively effect change and budgets that rival those of Fortune 50 organizations. These jobs require negotiation skills and the ability to explain the benefits of technology simply and clearly to everyone from weary taxpayers to skeptical legislators. Though the pressures of public scrutiny can be intense, the unique reward, say public-sector CIOs, is the fulfilling sense of stewardship on behalf of taxpayers.

## Emerging Technology: Autocategorization

By Fred Hapgood | 108

**TOPICAL SEARCH ENGINES** have struggled to accommodate the three main search types: finding known objects in huge search spaces, assembling top-down overviews that can orient naive users to a general topic, and helping searchers decide what they really want when their initial search terms are ambiguous. Until recently, IT applications were dependent on people to think up the category names, define their relationships and write the rules that channeled data into the right category boxes. This costly process limited the categorization technique to industries with big budgets, such as financial analysis or defense. But during the past few years, several developments, including the maturation of natural language recognition technologies, have made it much easier to automate or at least semiautomate categorization, sparking growth in sophisticated enterprise-level search engines.



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